SYLLABUS 2020-21

Program Sl. No.	Name of the Program	Total Pages	Pages	
			From	To
1	B.A.-Part-I	92	2	93
2	B.A.-Part-II	82	94	175
3	B.A.-Part-III	79	176	254
4	B.Com.-I	37	255	291
5	B.Com.-II	23	292	314
6	B.Com.-III	36	315	350
7	B.Sc.-I	106	351	456
8	B.Sc.-II	94	457	550
9	B.Sc.-III	91	551	641
10-13	M.A.-Economics I-IV sem	22	642	663
* 14-15	M.A.-Geography I-II sem	44	664	707
16-19	M.A.-Hindi I-IV sem	31	708	738
20-23	M.A.-Political Science I-IV sem	19	739	757
24-27	M.A.-Sociology I-IV sem	41	758	798
* 28-29	M.Com. I-II sem	49	799	847
* 30-31	M.Sc. Physics I-II sem	42	848	889
32-35	M.Sc. Botany I-IV sem	61	890	950
36-39	M.Sc. Chemistry I-IV sem	55	951	1005
40-43	M.Sc. Mathematics I-IV sem	57	1006	1062
44-47	M.Sc. Zoology I-IV sem	57	1063	1119
48-49	PGDCA I-II sem	21	1120	1141

NB- 2020-21- There was no enrollment in M.A.-III, IV Geography, M.Sc.-III, IV sem Physics and M.Com.-III, IV semester *

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. १५६० /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–एक के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

——00——

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–एक के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी, प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान, लाईब्रेरी साईंस
2. बी.एस–सी. – आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.एस.सी– (गृह विज्ञान) आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. विधि – एल.एल.बी.
5. प्रबंध – बी.बी.ए.

उपरोक्त विषयों को शिक्षा सत्र 2019–20 से संशोधित रूप में स्नातक स्तर भाग–एक के लिए लागू किया जाता है स्नातक स्तर भाग दो एवं तीन के पाठ्यक्रम यथावत रहेंगे।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार।

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REVISED ORDINANCENO.11
(As per State U.G.C. Scheme)
BACHELOR OF ARTS

1. The three yearcourse has been broken up in to three Parts.
Part-I Examination: at the end ofthe first year.
Part-II Examination: at the end of the second year and
Part-III Examination:at the end of the third year.

2. A candidate who after passing (10+2) or intermediate exam-nation of C.G. Board of Secondary Education, C.G. oranyother examination recognized by the Universityor C.G. Board of Secondary Education asequivalent there to, has attended regular course of studyinan affiliated college orinthe Teaching Department of the University for one academic year shall be eligible for appearing atthe B.A. Part-I examination.

3. A candidate who after passing B.A. Part-I examination of the University or anyother examination recognized by the University as equivalent there to has attended regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part II Examination.

4. A candidate who after passing B.A.PartII examination of the University has completed a regular course of study for one academic year in anaffiliated college orin theTeaching Department of the University shall be eligible for appearing at the B.A. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students andnon-college at ecan did ates shall beeligible for admission other examination as per provisions of Ordinance N. 6 relating to Examinations (General). Provided that non- college ate can did at esshallbepermitted to offeronly suchsubjects/paper sasare taught to the regular students at any of the University Teaching Department orCollege.

6. Every candidate for the Bachelor of arts examination shall be examined in:

A Foundation Course:
(i) Group A -HindiLanguage
(ii) Group B - EnglishLanguage

B Three course subjects:One subject from any three group out ofthe followings six groups:
1 Sociology / Ancient Indian History/Anthropology
2 Political Science/Home Science / Drawing &Painting / VocationalCourse.
3 Hindi Literature/ Sanskrit Literature/Urdu Literature/Mathematics.
4 Economics/Music/DefenseStudies/Linguistics/ u``R;
5 Philosophy/Psychology/ Geography/ Education/Management.
6 History/English Literature/Statistics.
7 Practicals (If Nece ssary) for each coresubject.

7 Any candidate who has passed the B.A. examination of the University shall be allowed to present himself for examination in any of additional subject spres cribbed for the B.A. exami-nation and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.A. PartI examination in the subject which he proposes to offer and then the B.A.PartII and PartIII examinationin the same subject. Successfull candidate will be given acertificate to that effect.

8 Inorder to pass atany part of the three year degree course examination, an examinee must obtain not less than33% of the total makrs in each subject/group of subjects .In subject /group of subjects, where both theory and practical examination are provided, an examinee must pass in both the ory and practical part so the examination separately.

9 Candidate will have to pass separately at the Part-I, Part II and part-III examination. No division shall be assigned on the result of the Part-I and Part-II examination. In deter mining the divison of the Final examination, total marks obtained by the examinees, in their Part-I,Part-II and Part-III examination in the aggregate shall be taken in to account. Candidate will not be allowed to change subjects after passing Part IExamination.

Provided in case of candidate who has passed the examination through the supplementary examination having fail edin one subject only the total aggregate marks being carried over for determining the division shall in clued the actual mark so btained in the subject in which he appeared at the supplementary examination.

10 Successful exminee sat the Part-III examination obtaining 60% or more marks shall be placed in the First division, those obtain in gless than 60% but not less than 45% marks in the Second division and other successful examinees in the third division.

SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Min. Marks
	i) Environmental Studies		75	33
	Fild Work		25	
A.	Foundation Course			
	i) Hindi Language - I		75	26
	ii) English Language - II		75	26
B.	Three Core Subject :			
	1. Hindi Literature	I	75	50
		II	75	
	2. Sanskrit Literature	I	75	
		II	75	50
	3. English Literature	I	75	
		II	75	50
	4. Philosophy	I	75	
		II	75	50
	5. Economics	I	75	
		II	75	50
	6. Political Science	I	75	
		II	75	50
	7. History	I	75	50
		II	75	
	8. Ancient Indian History	I	75	50
	Culture & Archaeology	**II**	75	
	9. Sociology	I	75	50
		II	75	
	10. Geography	I	50	33
		II	50	
		Practical	50	17
	11. Mathematics	I	50	
		II	50	50
		III	50	
	12. Statistics	I	50	33
		II	50	
		Practical	50	17

	Subject	Paper	Max. Marks	Min. Marks
13.	Anthropology	I	50	33
		II	50	
		Practical	50	17
14.	Linguistics	I	75	50
		II	75	
15.	Music	I	50	33
		II	50	
		Practical	50	17
16.	Home Science	I	50	33
		II	50	
		Practical	50	17
17.	Education	I	75	50
		II	75	
18.	Psychology	I	50	33
		II	50	
		Practical	50	17
19.	Management	I	75	50
		II	75	
20.	Defence Studies	I	50	
		II	50	33
		Practical	50	17
21.	Urdu	I	75	50
		II	75	
22.	Dance	I	50	33
		II	50	
		Practical	50	17

Part - I

SYLLABUS FORENVIRONMENTAL STUDIES AND HUMAN RIGHTS

(Papercode-0828)

MM. 75

इन्वारमेंटल साईंसे के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओ ंमें विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है। स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न–पत्र उत्तीर्ण करना अनिवार्य है। तभी उपाधि प्रदाय योग्य होगी।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होंगे एवं 25 अंकक्षेत्रीय कार्य (Field Work) पर्यावरण पर होंगे।

सैद्धांतिक प्रश्नों पर अंक – 75 (सभी प्रश्न इकाई आधार पर रहेंगे जिसमें विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक
(ब) निबंधात्मक – 50 अंक

Field Work– 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा। अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेंगे।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी। पर्यावरण विज्ञान के

सैद्धांतिक एवं फील्ड वर्क के संयुक्त रूप से 33ः (तैंतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे।

UNIT-I THE MULTI DISCIPLINARY NATUREOF ENVIRONMENTALSTUDIES

Definition, Scope and
Importance Natural Resources:
Renewable and Nonrenewable Resources

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction,mining, dams and their effects on forests and tribal people and relevant forestAct.

(b) Water resources: Use and over-utilization of surface and ground water, floodsdrought, conflicts over water, dam′s benefits and problems and relevantAct.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineralresources.

(d) food resources: World food problems, changes caused by agriculture andovergrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging ,salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energysources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

(12 Lecture)

UNIT-II ECOSYSTEM

(a) Concept, Structure and Function of andecosystem

- Producers, consumers and decomposers.
- Energy flow in theecosystem
- Ecologicalsuccession
- Food chains, food webs and ecologicalpyramids.
- Introduction, Types, Characteristics Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecosystem.

(b) Biodiversity and itsConservation

- Introduction - Definition: genetic. species and ecosystemdiversity
- Bio-geographical classification ofIndia.
- Value of biodiversity: Consumptive use. productive use, social ethics, aesthetic and optionvalues.
- Biodiversity at global, National and locallevels.
- India as mega-diversitynation.
- Hot spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild lifeconflict.
- Endangered and endemic species ofIndia.
- Conservation of biodiversity: In situ and Ex-situ conservation ofbiodiversity.

(12Lecture)

UNIT- III

(a) Causes, effect and control measuresof

- Air water, soil, marine, noise, nuclear pollution and Humanpopulation.
- Solid waste management: Causes, effects and control measures of urban and industrialwastes.
- Role of an individual in prevention ofpollution.
- Disaster Management: floods, earthquake, cyclone andlandslides.

(12Lecture)

(b) EnvironmentalManagement

- From Unsustainable to sustainabledevelopment.
- Urban problems related toenergy.
- Water conservation, rain water harvesting, watershedmanagement.
- Resettlement and rehabilitation of people, its problems andconcerns.
- Environmental ethics: Issues and possiblesolutions.
- Climate change, global warming, acid rain, ozone layer depletion,nuclear accidents andholocaust.
- Wastelandreclamation
- Environment protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and HumanHealth.

UNIT- IV

General background and historical perspective- Historical development and concept of Human Rights, Meaning and definition of Human Rights, Kind and Classification of Human Rights.
Protection of Human Rights under the UNO Charter, protection of Human Rights under the Universal Declaration of Human Rights, 1948.
Convention on the Elimination of all forms of Discrimination against women.
Convention on the Rights of the Child, 1989.

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State policy under the Constitution of India, Enforcement of Human Rights in India.

Protection of Human Rights under the Human Rights Act, 1993- National Human Rights Commission, State Human Rights Commission and Human Rights court in India.Fundamental Duties under the Constitution of India.

Reference/ Books Recommended

1. SK Kapoor- Human rights under International Law and IndianLaw.
2. HO Agrawal- Internation Law and HumanRights
3. एस.के. कपूर –मानव अधिकार
4. जे.एन. पान्डेय – भारत का संविधान
5. एम.डी. चतुर्वेदी – भारत का संविधान
6. J.N.Pandey - Constitutional Law ofIndia
7. Agarwal K.C. 2001 Environmental Biology, Nidi pub. Ltd.Bikaner
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28. Wanger K.D.1998, Environmental Management. W.B. Saunders Co. Philadelphia,USA 499p

संशोधित पाठ्यक्रम

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.

भाग – एक (आधार पाठ्यक्रम)

प्रश्न पत्र– प्रथम (हिन्दी भाषा)

(पेपर कोड –0101) पूर्णांक– 75

नोट :–

1. प्रश्न पत्र 75 अंक का होगा।
2. प्रश्न पत्र अनिवार्य होगा ।
3. इसके अंक श्रेणी निर्धारण के लिए जोड़े जायेंगे।
4. प्रत्येक इकाई के अंक समान होंगे।

पाठ्य विषय :–

इकाई–1

क. पल्लवन, पत्राचार, अनुवाद, पारिभाषिक शब्दावली एवं हिंदी में पदनाम

ख. ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई–2

क. शब्द शुद्धि, वाक्य शुद्धि, शब्द ज्ञान–पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द एवं मुहावरे–लोकोक्तियाँ

ख. भारत वंदना (कविता)– सूर्यकान्त त्रिपाठी निराला

इकाई–3

क. देवनागरी लिपि – नामकरण, स्वरूप एवं देवनागरी लिपि की विशेषताएँ, हिंदी अपठित गद्यांश, संक्षेपण, हिंदी में संक्षिप्तीकरण

ख. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई

इकाई–4

क. कम्प्यूटर का परिचय एवं कम्प्यूटर में हिंदी का अनुप्रयोग

ख. शिकागो से स्वामी विवेकानंद का पत्र

इकाई–5

क. मानक हिन्दी भाषा का अर्थ, स्वरूप, विशेषताएँ, मानक, उपमानक, अमानक भाषा

ख. सामाजिक गतिशीलता – प्राचीन काल, मध्यकाल, आधुनिक काल

मूल्यांकन योजना :–

प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 होंगे। प्रश्न–पत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य :–

व्याकरण के बुनियादी ज्ञान, संप्रेषण, कौशल, सामाजिक संदेश एवं भाषायी दक्षता को ध्यान में रखते हुए यह पाठ्यक्रम प्रस्तावित है।

FOUNDATION COURSE

PAPER - II

ENGLISH LANGUAGE (Paper Code-0102) M.M. 75

UNIT-1 **Basic Language skills : Grammar and Usage.**

Grammar and Vocabulary based on the prescribed text. To be assessed by objective / multiple choice tests.

(Grammar - 20 Marks
Vocabulary - 15 Marks)

UNIT-2 **Comprehension of an unseen passage.** 05

This should simply not only (a) an understanding of the passage in question, but also

(b) a grasp of general language skills and issues with reference to words and usage

within the passage and (c) the Power of short independent composition based on themes and issues raised in the passage.

To be assessed by both objective multiple choice and short answer type tests.

UNIT-3 **Composition :** Paragraph writing 10

UNIT-4 **Letter writing** (The formal and one Informal) **10**

Two letters to be attempted of 5 marks each. One formal and one informal.

UNIT-5 Texts : **15**

Short prose pieces (Fiction and not fiction) short poems, the pieces should cover a range of authors, subjects and contexts. With poetry if may sometimes be advisable to include pieces from earlier periods, which are often simpler than modern examples. In all cases, the language should be accessible (with a minimum of explanation and reference to standard dictionaries) to the general body of students schooled in the medium of an Indian language.

Students should be able to grasp the contents of each place; explain specific words, phrases and allusions; and comment on general points of narrative or argument. Formal Principles of Literary criticism should not be taken up at this stage.

To be assessed by five short answers of three marks each.

BOOKS PRESCRIBED -

English Language and Indian Culture - Published by M.P. Hindi Grant Academy Bhopal.

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

संशोधित पाठ्यक्रम

बी. ए. भाग–1

हिन्दी साहित्य

प्रथम– प्रश्न पत्र

(प्राचीन हिन्दी काव्य) पूर्णांक 75

(पेपर कोड– 0103)

उद्देश्य एवं प्रस्तावना–

प्राचीन से तात्पर्य है– आधुनिक काल से पूर्व का काल। सही अर्थ में हिन्दी भाषा और साहित्य का विकास आदिकाल से शुरू होता है। इसमें धार्मिक तथा ऐतिहासिक दो प्रकार का साहित्य मिलता है, जो प्रबंध, मुत्तक, रासो, फागु, चरित, सुभाषित आदि विविध काव्यरूपों में अभिव्यंजित है। मध्यकालीन साहित्य की पृष्ठभूमि के रूप में इसे प्रतिष्ठापित किया जाता है।

मध्यकालीन काव्य में भक्तिकाव्य, जहां लोक जागरण को स्वर देने वाला है, वहीं रीतिकाल अपने लौकिक– श्रृंगारिका, परिदृश्य में तत्कालीन सामाजिक, सांस्कृतिक, राजनीतिक स्थितियों को बेलौस अभिव्यंजित करता है। अतः भाषा, संस्कृति, विचार, मानवता, काव्यरूपता, लौकिकत– पारलौकिकता, आदि दृष्टियों से इसका अध्ययन अत्यावश्यक है।

पाठ्य विषय–

1. कबीर (कबीर– कांतिकुमार जैन, प्रारंभिक 50 साखियाँ)
2. जायसी– (संक्षिप्त पद्मावत– श्यामसुंदर दास, नागमती वियोग वर्णन)
3. सूर (भ्रमर गीत सार– सं. आचार्य रामचन्द्र शुक्ल, प्रारंभिक 25 पद)
4. तुलसी – "रामचरित मानस" के सुंदरकाण्ड से प्रारंभिक 30 दोहे चौपाई छंद साहिंत
5. घनानन्द (घनानन्द– सं. विश्वनाथ प्रसाद मिश्र, प्रारंभिक 25 छंद)

द्रुत पाठ हेतु निम्नांकित तीन कवियों का अध्ययन किया जावेगा– जिसमें से किन्हीं दो पर लघुउत्तरीय प्रश्न पूछे जायेंगे–

1. विद्यापति
2. रहीम
3. रसखान

अंक विभाजन–

1. व्याख्याएँ (3) – 21 अंक
2. आलोचनात्मक प्रश्न (2) – 24 अंक
3. लघुउत्तरीय प्रश्न (5) – 15 अंक
4. वस्तुनिष्ठ प्रश्न (15) – 15 अंक

संशोधित

बी. ए. भाग–1

हिन्दी साहित्य

द्वितीय– प्रश्न पत्र

हिन्दी कथा साहित्य पूर्णांक 75

(पेपर कोड– 0104)

उद्देश्य एवं प्रस्तावना–

गद्य की प्रमुख विधाओं का इतना द्रुत विकास इनकी लोकप्रियता का प्रमाण प्रस्तुत करता है। इसमें आधुनिक जीवन, ,अपनी विविध कमियों के साथ यथार्थ रूप में अभिव्यंजित हुआ है। जीवन की अनुभूतियाँ, संवेदनाओं तथा विविध परिस्थितियों के साक्षात्कार के लिए इनका अध्ययन सर्वथा अपेक्षित है।

पाठ्य विषय–

व्याख्या एवं आालोचनात्मक प्रश्नों के लिए एक उपन्यास एवं आठ कहानीकारों की एक– एक प्रतिनिधि कहानी का अध्ययन आवश्यक है।

उपन्यास 1. प्रेमचंद – गबन

कहानी
1. प्रेमचंद – कफन
2. जयशंकर प्रसाद – आकाश दीप
3. यशपाल – परदा
4. फणीश्वनाथ रेणु – ठेस
5. मोहन राकेश – मलबे का मालिक
6. भीष्म साहनी – चीफ की दावत
7. गुलशेर खाँ शानी – जली हुई रस्सी
8. रांगेय राघव – गदल

द्रुत पाठ के लिए निम्नांकित तीन कथाकारों का अध्ययन अपेक्षित है, जिनमें से किन्हीं दो पर लघुउत्तरीय प्रश्न पूछे जावेंगे–

1. उपेन्द्रनाथ अश्क, 2. बाल शौरि रेड्डी 3. शिवानी

अंक विभाजन– व्याख्या (3) 21 अंक
आलोचनात्मक प्रश्न (2) 24 अंक
लघुउत्तरीय प्रश्न (5) 15 अंक
वस्तुनिष्ठ प्रश्न (15) 15 अंक

B.A. Part-I

ENGLISH LITERATURE

There will be two literatures in English-1550-1750 Papers, each carrying

Maximum marks-75.

Nine questions are to be attempted in each peper.Each question carries the marks according to the scheme mentloned in each paper.

ENGLISH LITERATURE

PAPER - I

LITERATURE IN ENGLISH - 1550-1750 (Paper Code-0105) M.M.75

(i) Unit-1of annotation is compulsery,and passages to be set fromUnits(II toV), atleast one from each unit, 3to be attempted.

3x5 =15

(ii) Multiplechoice/objective type questions to beset unit vii,15 to be set10 be attempted.

1x1 =10

(iii) FromUnit-II toVI-8 questions to be setatleast one from each unit-5 to be attempted.

10x5 =50

Word Limit for each answer 300 to 400 words.

UNIT-1 ANNOTATIONS.

UNIT-2 POETRY

a) Shakespeare-SonnetNo.1FromFairestCreatures,SonnetNo.154.,Thelittle LoveGod.
b) Milton-HowSoonHathTimetheSubtleTheifofYouth...
c) John Donne - Sweetest Love I Don't go, Thisis my play's LastScene.

UNIT-3 POETRY

a) John Dryden - Portrait of Shadwell.
b) Alexander-Pope-FromAnEssyonCriticism(Truecaseinwriting....)and the world's Victor Stood subdned bysound.

UNIT-4 PROSE

a) Bacon OfStudies, Of Health, OfFriendship
b) Addison-Sir Roger atHome
c) Steele OftheClub.

UNIT-5 DRAMA

Shake spear - The Merchant of Venice

UNIT-6 Fiction - Swift - The Battle of the Books.

UNIT-7 Historicaland LiteraryTopics

i. The Renaissance.
ii. Humanism.
iii. Reformation.
iv. TheRestoration.
v. The EarlierDrama
vi. Petrachism and the SonnetCycle.
vii. The Influence of Seneca and Classical DramaticTheory
viii. The Elizabethan and Jacobeanstage.
ix. RestorationDrama
x. The Rise of PeriodcalEssay

BOOKS RECOMMENDED for Unit VII in Papers I and II

EdwardAlbert	-	A History of EnglishLiterature.
IforEvans	-	A shortHistory of EnglishLiterature.
Hudson	-	An Outline History of EnglishLiterature.

Both the papers of B.A.Part-I are included in the anthologies prescribed in the previous syllabus for B.A.Part-I and B.A.Part-II

Dr. M. Chakraborty DR. S Gupta DR. MERILY ROY

ENGLISH LITERATURE
PAPER - II
LITERATURE IN ENGLISH FROM 1750-1900 (Paper Code-0106)

Note-

i. Unit-1.ofannotationiscompulsory,6passagesbesetfromUnits(IItoIV)atleast one from each unit, 3 tobeattempted.
3x5 =15

ii. MultipleChoice/objectivetypequestionstobesetfromunit-VII,25tobeset10 tobeattempted.
1x10 =10

iii. FromUnits11toVI-8questions to beset atleast one from each Unit-5to be attempted.
10x5 =50

Word Limit for each answer 300 to 400 words.

UNIT-1 ANNOTATIONS

UNIT-2 POETRY -

a) Blake-Tiger,TigerBurningBright.
b) Wordsworth - Daffodils and SolitaryReaper.
c) Coleridge-FrostatMidnight.

UNIT-3 POETRY-

a) Shelley - Ode to askylark.
b) Keats - Ode toAutumn.
c) Tennyson - Crossing theBar.
d) Browing -Prospice.

UNIT-4 PROSE

a) Lamb - Dream Children : AReverie
b) Hazlit - On Actors andActing

UNIT-5 Fiction Jane Austen - Pride and prejudice.

UNIT-6 Fiction Charles Dickens - David Copperfield

UNIT-7 Historicaland LiteraryTopics.

i. The ReformActs.
ii. The Impact of Industrialization.
iii. Colonialism AndImperialism.
iv. Scientific the ughts anddiscoveries.
v. Faith andDoubt.
vi. Classical and Romantic Concepts ofImagination.
vii. Varieties of Romantic and VictorianPoetry.
viii. The VictorianNovel.
ix. Realism and theNovel.
x. Aestlheticism.

Dr. M. Chakraborty — DR. MERILY ROY

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

B.A. – I

P S Y C H O L O G Y

Paper	Name of the Paper	Max. Marks	Duration
I	Basic Psychological Processes	50	3 hrs.
II.	Psychopathology	50	3 hrs.
III.	Practicum	50	4 Hrs.

PAPER - I

BASIC PSYCHOLOGICAL PROCESSES (Paper Code-0119) **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Introduction: Definition and Goals of Psychology; Behaviouristic, Cognitive and Humanistic; Cross-cultural Perspectives. Methods: Experimental, Observational, Interview, Questionnaire, and Case study.

UNIT-2 Biological Basis of Behaviour: Genes and Behaviour, The Nervous System: The Central Nervous System (C.N.S.), The Autonomic Nervous System (A.N.S.) and The Peripheral Nervous System (P.N.S.); Glands and Hormones; Emotions- Types and Bodily changes (internal and external).

UNIT-3 Sensory and Perceptual Processes: Nature and Types of Sensation, Perception and Attention: Process, Definition, Types and Determinants; Principles of Perceptual Organization; Illusion: Nature and Types.

UNIT-4 Learning and Memory: Classical and Operant Conditioning- Basic Processes; Verbal and Observational Learning; Memory: Sensory (S.M.), Short-term (S.T.M.) and Long-term (L.T.M.); Forgetting: Process and Theories.

UNIT-5 Cognitive and Non-Cognitive Processes: Intelligence: Nature and Types; Motivation: Biogenic and Sociogenic Motives; Thinking Process: Nature and Types. Personality: Nature and Determinants; Approaches to study Personality: Trait and Type Approaches; Assessment of Personality.

References

1. सिंह अरूण कुमार सामान्य मनोविज्ञान। मोतीलाल बनारसीदास
2. वर्मा, आधुनिक, सामान्य मनोविज्ञान।
3. Baron, R.A. & Byrne, D.A. Understanding Behavior. Tokyo: Halt Sounders.
4. Zimbardo, P.G. Psychology. New York: Haper Collings College publishers.
5. Lefton, L. A. (1985). Psychology. Bosten-Allyn Publishers.
6. Walser, A.L. (1997).

22.6.19

22.06.2019

B.A. – I

P S Y C H O L O G Y

PAPER- II

PSYCHOPATHOLOGY (Paper Code-0120) **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Introduction: The concept of Normality and Abnormality; Models of Psychopathology: Psychodynamic, Behavioral and Cognitive.

UNIT-2 Assessment of Psychopathology: Diagnostic Tests, Rating Scales, Clinical Interview, and Projective Tests.

UNIT-3 Anxiety Disorders: Panic Disorder, Phobias, Obsessive Compulsive Disorder (OCD), and Generalized Anxiety Disorder (GAD).

UNIT-4 Mood Disorders: Manic-Depressive Episode and Dysthemia; Personality Disorders: Paranoid, Schizoid, and Dependent Personality Disorder, Dissociative disorder and Obesity.

UNIT-5 Management of Psychopathology: Stress Management; Medico and Psychosocial Therapy: Shock Therapy, Psychoanalysis, Group therapy and Behavior therapy.

References

1. Lamm, A. (1997). Introduction to Psychopathology. NY: Sage.
2. Buss, A. H. (1999). Psychopathology. NY: John Wiley.
3. सिंह तथा तिवारी। असामान्य मनोविज्ञान। आगरा विनोद पुस्तक मंदिर।
4. कपिल, एच. के.। असामान्य मनोविज्ञान। आगरा। हरप्रसाद भार्गव।

22.6.19

22.06.2019

B.A. – I

P S Y C H O L O G Y

PAPER- III

PRACTICUM **M.M.:50**

Note: This paper consists of two parts:

Part-A

(a) Comprises of Laboratory **Experiments**.
(b) Comprises of Psychological **Testing** and understanding of self and others.

(a) **Experiments-** (Any five of the following) :-

(i) Effect of Set on Perception
(ii) Effect of Frustration on Performance.
(iii) Division of Attention.
(iv) Learning Curve/ Serial Position Curve.
(v) Retroactive Inhibition (RI).
(vi) S.T.M.
(vii) Concept Formation.
(vii) Judgment of Emotions through Facial Expressions.
(ix) Personality Test

(b) **Psychological Tests** (Any four of the following)

(i) Verbal/ Nonverbal Intelligence Test/ Performance Tests.
(ii) E.P.I./ Personality (iii) Anxiety test.
(iv) Depression Scale (v) Adjustment Inventory.
(vi) Achievement motivation. (vii) Stress Tolerance Test.

Part-B

Anecdotal Record: Each student will be required to observe the behaviour of pupil in different setting and select an anecdote to understand, judge and narrate it as objectively as possible, so as to reveal his/her psychological insight existing in that anecdotal behavior. This record constitutes a part of psychological assessment of the students. Introduction to the measures of central tendency and graphical presentation of the ungrouped data.

Distribution of Marks

A.	Conduction of Psychological Experiment and Reporting	-	15 Marks
B.	Administration of one Psychological Test and Reporting	-	15 Marks
C.	Evaluation of Practical notebook and Anecdotal record	-	10 Marks
D.	Viva-voce	-	10 Marks

Note : No candidate will be allowed to appear in the practical examination unless his/her day-to-day practical work and the report are found satisfactory.

References Choubey, A. (2015). Psycho-lab- Experiment and Test. Raipur: Vaibhav Prak

22.6.19

22.06.2019

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. प्रथम वर्ष

इतिहास

प्रश्न पत्र –प्रथम

भारत का इतिहास, प्रारंभ से 1206 ई. तक

इकाई–1

1. भारत की भौगोलिक संरचना
2. भारतीय इतिहास के स्त्रोतों का सर्वेक्षण
3. पूर्ण पाषाण काल एवं उत्तर पाषाण काल
4. हड़प्पा सभ्यता– निर्माता, प्रसार, नगर योजना, राजनीतिक, सामाजिक, आर्थिक संरचना

इकाई–2

5. ऋग्वैदिक काल – राजनीतिक, सामाजिक, आर्थिक
6. ईसा पूर्व छठवी शताब्दी का भारत –महाजनपद काल
7. जैन एवं बौद्ध धर्म
8. सिंकदर का आक्रमण और उसका प्रभाव

इकाई–3

9. चंद्रगुप्त मौर्य एवं अशोक
10. मौर्य प्रशासन, कला एवं संस्कृति, अशोक का धम्म
11. मौर्योत्तरकाल – शुंग, कुषाण एवं सातवाहन
12. संगमयुग– साहित्य, संस्कृति, चोल एवं पाण्ड्य

इकाई–4

13. गुप्तयुग– समुद्रगुप्त की विजयें एवं चंद्रगुप्त द्वितीय, प्रशासन, आर्थिक, सामाजिक, सांस्कृतिक दशा
14. राजपूतों की उत्पत्ति एवं प्रशासनिक तथा सामाजिक विशेषताएं
15. पल्लव, चालुक्य, वर्धन, पाल, राष्ट्रकुट
16 भारत का दक्षिण पूर्व एशिया एवं श्रीलंका से संबंध
17. मोहम्मद बिन कासिम, महमूद गजनवी एवं मुहम्मद गोरी का आक्रमण

इकाई–5

18. छत्तीसगढ़ का परिचय– नामकरण एवं भौगोलिक स्थिति
19. छत्तीसगढ़ के प्रमुख क्षेत्रीय राजवंश–पाण्डुवंश, शरभपुरीय,
20. छत्तीसगढ़ के प्रमुख राजवंश– नलवंश, छिन्दक नागवंश,
21. दक्षिण कोसल के कल्चुरी वंश, राजनीतिक एवं प्रशासनिक व्यवस्था

संदर्भ ग्रन्थ सूचीः–

1. रतिभानु सिंह नाहर — प्राचीन भारतीय इतिहास एवं संस्कृति
2. शांता शुक्ला — भारत का राजनीतिक इतिहास
3. द्विजेन्द्र नारायण एवं श्रीमाली — प्राचीन भारत
4. ओम प्रकाश — प्राचीन भारत
5. बी.एन. लूनिया — प्राचीन भारतीय संस्कृति
6. एस.आर. शर्मा — प्राचीन भारत– प्रगैतिहासिक युग से 1200 ई. तक
7. K.L. Khurana — Ancient India from Earliest Time to 1206 A.D.
8. K.L. Khurana — History of India from Earliest Time to 1526 A.D
9. Vincent Smith — Oxford History of India
10. भार्गव — प्राचीन भारत
11. L. Prasad — Ancient India- Indius Volley Civilization to 1200 A.D
12. भगवान सिंह वर्मा — छत्तीसगढ़ का इतिहास प्रारंभ से 1947ई. तक
13. राम कुमार बेहार — छत्तीसगढ़ का इतिहास
14. ऋषिराज पांडे — दक्षिण कौशल के कल्चुरी
15. व्ही.व्ही. मिराशी — कल्चुरी नरेश और उनका काल
16. सुरेश चंद्र शुक्ला — छत्तीसगढ़ का समग्र अध्ययन
17. किशोर अग्रवाल — बीसवीं शताब्दी का छत्तीसगढ
18. सुरेश चंद्र शुक्ला अर्चना शुक्ला — छत्तीसगढ की रियासतों का विलीनीकरण एवं
19. लाला जगदलपुरी — बस्तर इतिहास एवं संस्कृति
20. प्यारेलाल गुप्त — प्राचीन छत्तीसगढ
21. सी.एल. शर्मा — छत्तीसगढ की रियासतें
22. हीरालाल शुक्ल — छत्तीसगढ का जनजातीय इतिहास
23. पी.एल. मिश्र — मुगलकालीन छत्तीसगढ़

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. प्रथम वर्ष
इतिहास
प्रश्न पत्र – द्वितीय
विश्व का इतिहास–1453 ई. से 1890 ई. तक

इकाई–1

1. यूरोप में आधुनिक युग की विशेषतायें, पुनर्जागरण
2. धर्म सुधार एवं प्रति धर्म सुधार आंदोलन
3. राष्ट्रीय राज्यों का उदय स्पेन, फ्रांस
4. राष्ट्रीय राज्यों का उदय इंग्लैण्ड, रूस

इकाई–2

1. वाणिज्यवाद, उपनिवेशवाद
2. औद्योगिक क्रान्ति
3. इग्लैण्ड में गृह युद्ध : घटनाएँ, कारण एवं परिणाम
4. गौरव पूर्ण क्रांति (1688)

इकाई–3

1. अमेरिका का स्वतंत्रता संग्राम
2. फ्रांस की क्रान्ति के कारण एवं प्रभाव
3. नेपोलियन युग
4. विएना कांग्रेस

इकाई–4

1. अनुदारवाद– मैटरनिक, आंतरिक एवं विदेश नीति
2. यूरोप में 1830 ई. एवं 1848 ई. की क्रान्ति
3. इंग्लैण्ड में उदारवाद 1832 एवं 1867 ई. का सुधार अधिनियम
4. पूर्वी समस्या– कारण, क्रीमिया युद्ध, बर्लिन सम्मेलन

इकाई–5

1. इटली का एकीकरण
2. जर्मनी का एकीकरण
3. बिस्मार्क की गृह नीति
4. बिस्मार्क की विदेश नीति

संदर्भ ग्रन्थ सूचीः–

- बी. एन. मेहता — अर्वाचीन यूरोप
- K.L. Khurana — History of Modern World
- Khurana And Sharma — Modern Europe 1453- 1789 A.D.
- जैन एवं माथुर — आधुनिक विश्व
- कौलेश्वर राय — आधुनिक यूरोप
- मथुरा लाल शर्मा — संयुक्त राज्य अमेरिका का इतिहास
- वी.एस. माथुर — संयुक्त राज्य अमेरिका का इतिहास
- बी.एन. लूणिया — आधुनिक पाश्चात्य इतिहास की प्रमुख धाराएं
- एल.पी. शर्मा — इंग्लैंड का इतिहास
  वी.डी. महाजन — इंग्लैंड का इतिहास
- जे.आर. काम्बले — अमेरिका का इतिहास
  A.C. Gupta — A History of China
- विपिन बिहारी सिन्हा — आधुनिक ग्रेटब्रिटेन

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS
B. A. Part- I (Economics)
Subject : Micro Economics, Paper-I (Code: 0111)

UNIT 1

Introduction - Definitions Nature and scope of Economics, Methodology in Economics, Utility - Cardinal and Ordinal approaches, Indifference curve, Consumer's equilibrium, Giffin goods, Demand - Law of Demand, Elasticity of demand Consumer's surplus

UNIT 2

Theory of production and cost, Production decision, Production function, Iso-quant, Factor substitution, Law of variable proportions, Returns to scale, Economies of scale, Different concepts of cost and their interrelation, Equilibrium of the firm.

UNIT 3

Market structure-perfect and imperfect markets, Equilibrium of a firm-Perfect competition, Monopoly and price discrimination, Monopolistic competition, Duopoly, Oligopoly, controlled and administered prices

UNIT 4

Factor pricing-Marginal productivity theory of distribution, Euler's theorem, Theories of wage determination, wages and collective bargaining, wage differentials, Rent - Scarcity Rent, differential rent, Quasi rent, Modern Rent Theory, Interest Classical and Keynesian Theories, Modern Theory, Profits - Innovation, Risk bearing and uncertainty theories

UNIT 5

Welfare economics: , What welfare economics is about ?, Role of value judgments in welfare economics, Pigou's contribution in the field of welfare economics, Concept and condition of Pareto optimality, New welfare economics: Kaldor-Hicks welfare criterion, Scitovsky paradox, Social welfare function and social choice: Bergson-

Samuelson social welfare function, Prof. Amartya Sen's critique, Arrow impossibility theorem.

References:

1. Bach, G. L. (1977) "Economics, " Prentice Hall of India, New Delhi.
2. Gauld, J.P. and Edward P. L. (1996), "Microeconomic Theory," Richard lrwin, Homewood.
3. Henderson J. and R. E. Quandt (1980), "Microeconomic Theory : A Mathematical Approach", McGraw Hill, New Delhi.
4. Heathfield and Wibe (1987), " An Introduction to Cost and Production Functions", Macmillan. London.
5. Koutsoyiannis, A. (1990), " Modern Microeconomics" , Macmillan.
6. Lipsey, R. G. and K. A. Chrystal (1999) "Principles of Economics ", (9th Edition), Oxford University Press, Oxford. B.A.-Part-I (21) P

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS
B. A. Part- I (Economics)
Subject : Indian Economy , Paper-II (Code: 0112)

UNIT 1

Pre and post independent Indian economy: A short introduction of economic policies of British India, State of economy at the time of independence, Planning exercise in India-Planning in India through different five Year Plans, The planning commission and NITI Aayog, Growth and development in pre-reform period, New Economic Reforms: Liberalization, Privatization and Globalization, Growth, development and structural change in post-reform period.

UNIT 2

Population and human development: Demographic trends and issues of education, health, malnutrition and migration. Growth and distribution: Trends and policies in poverty, inequality, unemployment and occupational distribution, International comparison in human development and poverty reduction

UNIT 3

Agriculture: Nature and importance, Trends in agriculture production and productivity, factors determining productivity, Land reforms, new agriculture strategies and green revolution, rural credit, Agricultural marketing, natural resources and infra-structure development: Performance, problems and policies, MUDRA Yojana.

UNIT 4

Industry: Growth and productivity, Industrial policy and reforms, Growth and problems of small and cottage scale industries, Role of public sector enterprises in India's industrialization. Trends and performance in services.

UNIT 5

External Sector - Role of foreign trade, Trends in exports and imports, Composition and direction of India's foreign trade, Export promotion measures and the new

26/6/19

trade policies, Recent macroeconomic scenario: National Income, investment, saving and inflation, Current macroeconomic policies and their impact, fiscal policies and monetary policy.

References

1. Uma Kapila “Indian Economy: Performance and Policies,” published by Academic Foundation.
2. Dutta and Sundram, “Indian Economy’, S. Chand Publications.
3. Mishra and Puri, “Indian Economy,” Himalaya Publishing House.
4. Economic Survey of India: various Issues, Published by Government of India.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम
सत्र 2019–20
दर्शन शास्त्र
बी.ए. भाग–एक, दर्शन शास्त्र में दो प्रश्न पत्र (75 अंक) के होंगे।

1. भारतीय दर्शन की रूपरेखा
2. पाश्चात्य दर्शन का इतिहास

प्रत्येक प्रश्न पत्र पांच इकाईयों में विभाजित है । प्रत्येक इकाई में से एक प्रश्न हल करना अनिवार्य होगा ।

बी.ए. भाग – एक
दर्शन शास्त्र
प्रथम – प्रश्न पत्र

भारतीय दर्शन की रूपरेखा

इकाई–1
1. भारतीय दर्शन – परिचय एवं मुख्य विशेषताएं
2. वेद एवं उपनिषद– ब्रह्म , आत्मा
3. चार्वाक दर्शन – तत्व मीमांसा

इकाई–2
1. जैन दर्शन – स्याद्वाद, जीव, बंधन एवं मोक्ष
2. बौद्ध दर्शन– चार आर्यसत्य, अनात्मवाद

इकाई–3
1. न्याय दर्शन – प्रमाण (प्रत्यक्ष एवं अनुमान), ईश्वर
2. वैशेषिक दर्शन– परमाणुवाद, सप्त पदार्थ

इकाई–4
1. सांख्य दर्शन – प्रकृति , पुरूष, विकासवाद
2. योग दर्शन – अष्टांग योग, ईश्वर

इकाई–5
1. शंकराचार्य का अद्वैत दर्शन– ब्रह्म, आत्मा, माया
2. रामानुज का विशिष्टाद्वैत – ब्रह्म, जीव, मोक्ष

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम

बी.ए. भाग – एक

दर्शन शास्त्र

द्वितीय – प्रश्न पत्र

पाश्चात्य दर्शन का इतिहास

इकाई–1 1. पाश्चात्य दर्शन – परिचय

2. प्लेटो– प्रत्ययों का सिद्धांत

3. अरस्तू– कारणता का सिद्धांत

इकाई–2 1. थामस एक्वीनास– ईश्वर के अस्तित्व के प्रमाण

2. डेकार्ट– संदेह पद्धति, आत्मा का अस्तित्व, ईश्वर का अस्तित्व

इकाई 3. 1. स्पिनोजा – द्रव्य, गुण, पर्याय

2. लाइबनित्ज– चिद्बिन्दुवाद

इकाई–4 1. जॉन लॉक– सहज प्रत्ययों का खंडन, मूलगुण एवं उपगुण

2. जॉन बर्कले – मूलगुण एवं उपगुण का खंडन, विज्ञानवाद

इकाई–5 1. ह्यूम– संस्कार और प्रत्यय, संदेहवाद, आत्मा का खंडन

2. कांट – समीक्षावाद

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

बी.ए. प्रथम वर्ष

संस्कृत साहित्य

प्रथम प्रश्नपत्र

टीप – बी.ए. प्रथम वर्ष में संस्कृत साहित्य के दो प्रश्न–पत्र होंगें एवं दोनों प्रश्न –पत्र 75– 75 अंकों के होंगें ।

नाटक, व्याकरण और अनुवाद पूर्णांक – 75

इकाई –1	स्वप्नवासवदत्तम् – व्याख्या	अंक – 15
इकाई –2	स्वप्नवासवदत्तम् – समीक्षात्मक प्रश्न	अंक – 15
इकाई –3	1. सुबन्त (शब्दरूप) – राम, मुनि, भानु, पितृ, करिन्, कर्तृ, आत्मन्, लता, मति, नदी, धेनु, मातृ, फल, वारि, सर्व, तद्, एतद्, यद्, इदम्, अस्मद्, युष्मद् । 2. तिङन्त (धातुरूप) – भ्वादि, दिवादि, तुदादि, चुरादि गण के अतिरिक्त अस् एवं कृ धातुओं के लट्, लृट्, लङ्, लोट् एवं विधिलिङ् लकारों के रूप 3. अपठित गद्यांश पर आधारित प्रश्न	अंक – 15

नोट– शब्द रूप एवं धातु रूप के विकल्प के रूप में अपठित गद्यांश पर आधारित प्रश्न भी पूछे जा सकते है ।

इकाई –4	प्रत्याहार, संज्ञा, सन्धि और विभक्त्यर्थ	अंक – 15
इकाई –5	हिन्दी से संस्कृत में अनुवाद	अंक – 15

अनुशंसित ग्रन्थ –

1. रचनानुवाद कौमुदी – डा. कपिलदेव द्विवेदी
2. संस्कृतस्य व्यावहारिकस्वरूपम् – डा. नरेन्द्र, श्री अरविन्द आश्रम
3. संस्कृतव्याकरण – श्रीधर वसिष्ठ
4. संस्कृत में अनुवाद कैसे करें – उमाकान्त मिश्र शास्त्री, प्रकाशक – भारती भवन
5. लघु सिद्धान्त कौमुदी – श्री महेश सिंह कुशवाहा, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी

31/05/19

बी.ए. प्रथम वर्ष

संस्कृत साहित्य

द्वितीय प्रश्नपत्र

गद्य, कथा एवं साहित्येतिहास पूर्णांक – 75

इकाई –1	शुकनासोपदेशः – व्याख्या	अंक – 15
इकाई –2	हितोपदेशः (मित्रलाभः) – व्याख्या	अंक – 15
इकाई –3	शुकनासोपदेश एवं हितोपदेश के समीक्षात्मक प्रश्न	अंक – 15
इकाई –4	वैदिक एवं पौराणिक साहित्य का सामान्य परिचय (वेद, ब्राह्मण, आरण्यक, उपनिषद्, वेदांगों एवं पुराणों का संक्षिप्त परिचय)	अंक – 15
इकाई –5	निम्नलिखित कवियों का परिचय – महाकवि कालिदास, भारवि, माघ, श्रीहर्ष, विशाखदत्त, बाणभट्ट, शूद्रक, विशाखदत्त, भवभूति ।	अंक – 15

अनुशंसित ग्रन्थ –

1. शुकनासोपदेश – प्रकाशक – मोतीलाल बनारसीदास, वाराणसी
2. हितोपदेश (मित्रलाभ) – प्रकाशक – मोतीलाल बनारसीदास, वाराणसी
3. वैदिक साहित्य और संस्कृति – आचार्य बलदेव उपाध्याय
4. संस्कृत साहित्य का इतिहास – आचार्य बलदेव उपाध्याय
5. संस्कृत साहित्य का अभिनव इतिहास – डा. राधावल्लभ त्रिपाठी, वि.वि. प्रकाशन, सागर, म.प्र.

31/05/19

Syllabus of Geography

(B.A./B. Sc. I Year)

Session

2019-2020
2020-2021

Brief Summary

3 Year Integrated UG Courses (B.A./ B.Sc.) in Geography

B.A. /B.Sc. Part I

The B.A. /B.Sc. Part-I Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper - I	Physical Geography
Paper - II	Human Geography.
Paper - III	Practical Geography

B.A. /B.Sc. Part-II

The B.A./B.Sc. Part-II Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper-I	Economic and Resources Geography
Paper-II	Regional Geography of India
Paper-III	Practical Geography

B.A. /B.Sc. Part III

The B.A. /B.Sc. Part III Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows

Paper – I	Remote Sensing and GIS
Paper - II	Geography of Chhattisgarh
Paper - III	Practical Geography

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

B.A. /B.Sc. Part I

PAPER - I
PHYSICAL GEOGRAPHY
Max. Marks: 50
(Paper Code-0117)

Unit I The Nature and Scope of Physical Geography. Origin of the Earth, Geological Time Scale, Earth's Interior, Continental Drift Theory (Wegner), Plate Tectonics, Isostasy.

Unit II Earth movements: Earthquakes and Volcanoes. Rocks, Weathering, Erosion, and Normal cycle of erosion, Evaluation of landscapes- Fluvial, Arid, Glacial, Karts and Coastal landscape.

Unit III Elements of Weather and Climate, Composition and Structure of the Atmosphere. World patterns of Atmospheric Temperature, Pressure, and Wind.

Unit IV Atmospheric Moisture, and Disturbances, Climatic Classification (Koppen and Thornthwait) types, characteristics and World patterns.

Unit V Surface relief of Pacific Ocean, Atlantic Ocean, and Indian Ocean. Distribution of Temperature and Salinity of oceans and seas, Currents and Tides, Ocean Deposits and Coral Reefs, and Oceanic Resources.

Books Recommended:

1. Barry, R. G. and Chorley, R. J. (1998): Atmosphere, Weather and Climate. Routledge, London.
2. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company. New Delhi
3. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
4. Garrison, T. (1998): Oceanography, Wordsworth Company., Belmont.
5. Lake, P. (1979): Physical Geography (English and Hindi editions), Cambridge University Press, Cambridge.
6. Lal, D.S. 1993 : Climatology, 3rd edition, Chaitanya Pub. House, New Delhi
7. Leong Goh Cheng (2003): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
8. Monkhouse, F.J. (1979): Physical Geography. Methuen, London
9. Singh, S. (2003): Physical Geography. (English and Hindi editions.). Prayag Pustak Bhawan, Allahabad;
10. Trewartha, G.T., Robinson, A.H., Hammond, E.H., and Horn, A.T. (1976/1990): Fundamentals of Physical Geography, 3rd edition. MacGraw-Hill, New York.
11. Singh, M.B. (2001): *Bhoutik Bhugol*, Tara Book Agency, Varanasi
12. Strahler, A.N. and Stahler, A.M. (1992): Modern Physical Geography. John Wiley and Sons, New York.

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Chandra

B.A. /B.Sc. Part I

PAPER - II
HUMAN GEOGRAPHY
Max. Marks: 50
(Paper Code-0118)

Unit I Definition and Scope of Human Geography. Man - environment relationship; Determinism, Possibilism, and Probabilism; Human Development Index (HDI).

Unit II Classification of Human Races – their Characteristics and Distribution; Human adaptation to environment: Eskimos, Bushman, Pigmy, Gond, Masai, and Naga.

Unit III Growth, Density and Distribution of World Population and factors influencing Spatial distribution; Over , Under, and Optimum Population; Migration of Population. .

Unit IV Settlements – Urban Settlements: Urbanization, Evolution and Classification, Trends of Urbanization.

Rural settlements: Characteristics, Types and Regional Pattern, Rural Houses in India - Types, Classification and Regional Pattern.

Unit V Issues – Global Warming, Climate Change, Deforestation, Desertification, Air, Water and Soil Pollution.

Books Recommended:

1. Chisholm, M. (1985): Human Geography, 2nd edition, Penguin Books, London.
2. De Blij, H.J.(1996): Human Geography: Culture, Society and Space,. 2nd edition. John Wiley and Sons, New York,
3. Fellman, J. D., Arthur, G., Judith, G., Hopkins, J. and Dan, S. (2007): Human Geography: Landscapes of Human Activities. McGraw-Hill, New York. 10th edition.
4. Haggett, P. (2004): Geography: A Modern Synthesis. 8th edition, Harper and Row, New York.
5. Huggett, R. J. (1998): Fundamentals of Biogeography, Routledge, London.
6. Hussain, M. (1994): Human Geography, Rawat Publications, Jaipur.
7. Johnston, R. J., Gregory, D., Pratt, G. and Watts, M. (2009): The Dictionary of Human Geography. 5th edition, Basil Blackwell Publishers, Oxford.
8. Kaushik, S.D. and Sharma, A.K. (1996): Principles of Human Geography (in Hindi), Rastogi Publication, Meerut.
9. Norton, W. (2008): Human Geography, Oxford University Press, New York. 5th ed.
10. Saxena, H. M. (2000): Environmental Management. Rawat Publications., Jaipur and New Delhi.
11. Singh, K. N. and Singh, J. (2001): *Manav Bhugol*. Gyanodaya Prakashan, Gorakhpur. 2nd edition.
12. Singh, L.R. (2005): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad
13. Smith, D. M.(1977): Human Geography- A Welfare Approach, Edward Arnold (Publishers) Ltd.,London
14. Stoddard, R.H., Wishart, D.J. and Blouet, B.W. (1986): Human Geography. Prentice-Hall, Englewood Cliffs, New Jersey.

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B.A. /B.Sc. Part I

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.5.19 (Dr. S. K. Das)

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27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी. – प्रथम वर्ष
प्रश्न पत्र–प्रथम
भौतिक भूगोल

अधिकतम अंक : 50

(कोड क्रमांक 0117)

इकाई –1. भौतिक भूगोल की प्रकृति एवं विषय क्षेत्र, पृथ्वी की उत्पत्ति, भूगर्भिक समय मापनी, पृथ्वी की आंतरिक संरचना, वेगनर का महाद्वीपीय प्रवाह सिद्धांत, पट्ट विवर्तन, भूसंतुलन ।

इकाई –2. पृथ्वी की हलचल–भूकंप, ज्वालामुखी, चट्टान अपक्षय, अपरदन, सामान्य अपरदन चक्र, वायु, हिम बहता जल, भूमिगत जल और सागरीय जल से निर्मित भूदृश्य ।

इकाई –3. मौसम और जलवायु के तत्व, वायुमंडल की संरचना एवं संघटन, वायुमंडलीय ताप, दाब तथा हवाएं ।

इकाई –4. वायुमंडलीय आर्द्रता विक्षोम, जलवायु वर्गीकरण कोपेन और थार्नथ्वेट के आधार पर वैश्विक जलवायु की विशेषताएँ और विश्व प्रतिरूप ।

इकाई –5. महासागरीय उच्चावच्च प्रशांत महासागर, आंध्रमहासागर एवं हिन्द महासागर । सामुद्रिक तापमान लवणता जलधाराएँ एवं, ज्वारभाटा, सामुद्रिक निक्षेप एवं प्रवाल भित्ती, सामुद्रिक संसाधन ।

Books Recommended:

1. Barry, R. G. and Chorley, R. J. (1998): Atmosphere, Weather and Climate. Routledge, London.
2. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company. New Delhi
3. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
4. Garrison, T. (1998): Oceanography, Wordsworth Company., Belmont.
5. Lake, P. (1979): Physical Geography (English and Hindi editions), Cambridge University Press, Cambridge.
6. Lal, D.S. 1993: Climatology, 3rd edition, Chaitanya Pub. House, New Delhi
7. Leong Goh Cheng (2003): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
8. Monkhouse, F.J. (1979): Physical Geography. Methuen, London
9. Singh, S. (2003): Physical Geography. (English and Hindi editions.). Prayag Pustak Bhawan, Allahabad;
10. Trewartha, G.T., Robinson, A.H., Hammond, E.H., and Horn, A.T. (1976/1990): Fundamentals of Physical Geography, 3rd edition. MacGraw-Hill, New York.
11. Singh, M.B. (2001): *Bhoutik Bhugol*, Tara Book Agency, Varanasi
12. Strahler, A.N. and Stahler, A.M. (1992): Modern Physical Geography. John Wiley and Sons, New York.

27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी. – प्रथम वर्ष
प्रश्न पत्र–द्वितीय
मानव भूगोल

अधिकतम अंक : 50

(कोड क्रमांक 0118)

इकाई –1. मानव भूगोल की परिभाषा एवं विषय क्षेत्र मानव वातावरण संबंध, निश्चयवाद, संम्भववाद प्रसम्भववाद, मानव विकास सूचकांक ।

इकाई –2. मानव प्रजाति उद्‌भव प्रकार विशेषताएँ एवं वितरण, मानव द्वारा वातावरण से अनुकुलन एस्किमो, बुशमेन, पिग्मी, गोंड, मसाई, और नागा ।

इकाई –3. वैश्विक जनसंख्या– वृद्धि, घनत्व, जनसंख्या के वितरण को प्रभावित करने वाले स्थानिक कारक, जनाधिक्य, न्यूनतम जनसंख्या और अनूकूलतम आदर्श जनसंख्या, जनसंख्या एवं प्रवास।

इकाई –4. अधिवास– नगरीय अधिवासः नगरीयकरण उद्‌भव, प्रकार एवं नगरीकरण के प्रतिरूप । ग्रामीण अधिवास : विशेषताएँ , प्रकार और क्षेत्रीय प्रतिरूप, भारत में ग्रामीण अधिवास, प्रकार, वर्गीकरण और क्षेत्रीय प्रतिरूप ।

इकाई –5. उभरते पर्यावरणीय मुद्‌दे– ग्लोबल वार्मिंग, जलवायु परिवर्तन निर्वनिकरण, मरूस्थलीकरण प्रदूषण – जल, वायु और मृदा प्रदूषण ।

Books Recommended:

1. Chisholm, M. (1985): Human Geography, 2nd edition, Penguin Books, London.
2. De Blij, H.J.(1996): Human Geography: Culture, Society and Space,. 2nd edition. John Wiley and Sons, New York,
3. Fellman, J. D., Arthur, G., Judith, G., Hopkins, J. and Dan, S. (2007): Human Geography: Landscapes of Human Activities. McGraw-Hill, New York. 10th edition.
4. Haggett, P. (2004): Geography: A Modern Synthesis. 8th edition, Harper and Row, New York.
5. Huggett, R. J. (1998): Fundamentals of Biogeography, Routledge, London.
6. Hussain, M. (1994): Human Geography, Rawat Publications, Jaipur.
7. Johnston, R. J., Gregory, D., Pratt, G. and Watts, M. (2009): The Dictionary of Human Geography. 5th edition, Basil Blackwell Publishers, Oxford.
8. Kaushik, S.D. and Sharma, A.K. (1996): Principles of Human Geography (in Hindi), Rastogi Publication, Meerut.
9. Norton, W. (2008): Human Geography, Oxford University Press, New York. 5th ed.
10. Saxena, H. M. (2000): Environmental Management. Rawat Publications., Jaipur and New Delhi.
11. Singh, K. N. and Singh, J. (2001): *Manav Bhugol*. Gyanodaya Prakashan, Gorakhpur. 2nd edition.
12. Singh, L.R. (2005): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad
13. Smith, D. M.(1977): Human Geography- A Welfare Approach, Edward Arnold (Publishers) Ltd.,London
14. Stoddard, R.H., Wishart, D.J. and Blouet, B.W. (1986): Human Geography. Prentice-Hall, Englewood Cliffs, New Jersey.

27.5.19 (Dr. S. K. Das)

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बी.ए./बी.एस.सी.–प्रथम वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

भाग– अ मानचित्र तकनीक एवं सांख्यिकी विधियां (25)

इकाई –1 मपनी– कथनात्मक मापन, प्रतिनिधि भिन्न सामान्य रैखिक मापनी विकर्ण तुलनात्मक एवं समय मापनी.

इकाई –2 उच्चावच प्रदर्शन की विधियां – हैश्यूर समोच्च रेखा, तथा विविध स्थलाकृतियों की प्रदर्शन.

इकाई –3 रैखिक आरेख, दंड आरेख, (सामान्य एवं मिश्रित) चक्र आरेख – समानुपातिक वृत्त आरेख विभाजित वृतारेख

इकाई –4 सांख्यिकी विधियां : औसत, माध्यिका , बहुलक

भाग– ब सर्वेक्षण (15)

इकाई –5 चैन और फीता सर्वेक्षण–त्रिभुजीकरण, खुला एवं बंद मार्ग मापन,

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा (10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Sharma

Revised syllabus

SOCIOLOGY 2019 - 2020

B.A. PART-I

Paper – I

INTRODUCTION TO SOCIOLOGY (Paper Code - 0115)

UNIT-I **Sociology** : Meaning, Nature, scope, Subject matter and significance.
Basic concepts : Society, Community, institution, Association, group, Status and role.

UNIT-II **Social Institutions:** Marriage, Family and kinship.
Culture and society: Culture, socialization, The individual and society, social control, norms and values.

UNIT-III **Social Stratification:** Meaning, forms and theories.
Social Mobility: Meaning, forms and theories.

UNIT-IV **Social change**: Meaning and patterns, types, factors, evolution and progress.

UNIT-V **Social System and process:** Social System- meaning, characteristics and elements.
Social process- Meaning, elements, characteristics and types.

ESSENTIAL READINGS :-

1 Bottomore T.B., Sociology- A guide to Problems and Literature, Bombay. George Allen and unwin(India) 1972.
2 Inkeles, Alex, What is Sociology ? New Delhi, Prentice Hall of India 1987.
3 Jayram, N., Introductory Sociology, Madras Maomillan India 1988.
4 Johnson Harry, M., Sociology of systematic Introduction New Delhi Allied Publishers 1995.

Shobhash 10/6/2019 — 10.06.2019 — 10-6-19

Revised syllabus

SOCIOLOGY -2019-2020

B.A. PART-I

Paper –II

CONTEMPORARY INDIAN SOCIETY (Paper Code-0116)

UNIT-I **Classical View about Indian Society:** Verna, Asharam, Karma, Dharma and Purusharth.

UNIT-II **The Structure and composition of Indian society.**
Structure ; Village ,Towns, Cities and Rural – Urban Linkage,
Compositions: Tribes, Dalits, Women and Minorities.

UNIT-III **Basic Institutions of Indian Society:**
Caste system, Joint Family, Marriage and Changing dimensions.

UNIT-IV **Familial Problems:**
Dowry, Domestic violence, Divorce, Intra-intergenerational conflict, problem of elderly.

UNIT-V **Social Problems:**
Surrogate Motherhood, Live in Relationship, Regionalism, Communalism, Corruption, Youth unrest.

ESSENTIAL READINGS :-

1 Dube, S. C. 1995. Society in India, New Delhi: National Book Trust.
2 Mandelbaum, D.G. 1970. Society in India, Bombay: Poular Prakashan.
3 Shriniwas, M.N. 1973. Social Change in Modern India, California: University of California Press.
4 Shriniwas, M.N. 1990. Social Change Structure, New Delhi: Hindustan Publishing Corporation.
5 Uberoi Patricia, 1993. Family and Marriage In India, New Delhi: Oxford University Press.

Shobhasth 10/6/2019

10.06.2019

10-6-19

बी. ए.. भाग एक B.A. Part I

राजनीति विज्ञान Political Science

प्रथम प्रश्न पत्र : राजनीतिक सिद्धान्त Paper I : Political Theory

इकाई 1 : राजनीति विज्ञान का अर्थ, परिभाषा (आधुनिक अवधारणा सहित) । राजनीति एक विशिष्ट मानवीय व्यवहार के रुप में । शक्ति, सत्ता, प्रभाव : अर्थ, विशेषताएं, प्रकार । राजनीति विज्ञान की अध्ययन पध्दतियां : परम्परागत एवं व्यवहारवाद एवं उत्तर व्यवहारवाद ।

Unit I : Meaning and Definition of Political Science (with modern concept). Politics as a specific human behaviour. Power, Authority and Influence : meaning, features and kinds. Method of Study to Political Science : Traditional , Behaviouralism and Post Behaviouralism.

इकाई 2 : राज्य एवं उसके आवश्यक तत्व । राज्योत्पत्ति के विभिन्न सिद्धान्त, मार्क्सवादी सिद्धान्त । सावयविक सिद्धान्त ।

Unit 2 : State and its essential elements. Various theories of the origin of the State, Marxist theory . Organismic Theory.

इकाई 3 : सम्प्रभुता एवं उसकी बहुलवादी आलोचना । अधिकारः अर्थ, प्रकार , सिद्धान्त । कर्तव्य । स्वतन्त्रता : अर्थ , प्रकार, संरक्षण । समानता : अर्थ , प्रकार एवं स्वतन्त्रता से सम्बंध । प्रजातन्त्र : परिभाषा, व्यापक अर्थ, चुनौतियां, सफलता के लिए आवश्यक शर्तें , गुण–दोष । प्रत्यक्ष प्रजातन्त्र ।

Unit 3: Sovereignty and its pluralistic criticism. Rights : meaning, kinds and theories. Duties. Liberty : meaning, kinds , safeguards. Equality : meaning, kinds and relations with Liberty. Democracy : meaning, comprehensive meaning, challanges, conditions for its success, merits and demerits. Direct Democracy.

इकाई 4 : शासन के प्रकार : एकात्मक व संघात्मक , संसदीय व अध्यक्षात्मक, निरंकुशतन्त्र । शासन के अंग : कार्यपालिका, व्यवस्थापिका, न्यायपालिका । शक्ति पृथक्करण का सिद्धान्त व नियंत्रण –संतुलन का सिद्धान्त । संविधान : अर्थ , प्रकार । प्रतिनिधित्व के सिद्धान्त एवं निर्वाचन प्रणालियां ।

Unit 4 : Kinds of Government : Unitary and Federal, Parliamentary and Presidential. Dictatorship. Organs of Government : Executive, Legislature and Judiciary. Theory of Separation of Powers and Checks and Balances. Constitution : meaning and kinds. Theories of representation and Electoral Process.

इकाई 5 : लोककल्याणकारी राज्य। दल पद्धति : अर्थ , प्रकार, पद्धति । दबाव समूह : अर्थ, प्रकार, तकनीक । सामाजिक परिवर्तन : अर्थ, विशेषताएं , सिद्धान्त । नारीवाद, राष्ट्रवाद ।

Unit 5 : Public Welfare State. Party System : meaning , kinds , process. Pressure Groups : meaning, kinds and technique. Social Change : meaning, characteristics, theories. Feminis. Nationalism.

27/6/19 27/6/19

बी.ए. प्रथम

प्रथम प्रश्न पत्र

राजनीतिक सिद्धान्त

1. ओ.पी. गाबा, समकालीन राजनीतिक सिद्धांत, मयूर पेपर बैक्स नोएडा।
2. ओ.पी. गाबा, राजनीति सिद्धांत की रूपरेखा, मयूर पेपर बैक्स नोएडा।
3. जे.सी. जौहरी व सीमा जौहरी, आधुनिक राजनीति विज्ञान के सिद्धांत, स्टर्लिंग पब्लिकेशन।
4. पंत गुप्ता जैन, राजनीति शास्त्र के आधार, सेन्ट्रल पब्लिकेशिंग हाऊस इलाहाबाद।
5. प्रो. आनंद प्रकाश अवस्थी , भारतीय शासन एवं राजनीति, लक्ष्मीनारायण अग्रवाल, आगरा।
6. Andrew Haywood Political Theory , An Introduction.
7. O.P. Gaba An Introduction to Political Theory, Macmillan India Ltd.

27/6/19

27/6/19

बी. ए. भाग एक B. A. Part I

राजनीति विज्ञान Political Science

द्वितीय प्रश्न पत्र : भारतीय शासन एवं राजनीति Paper II : Indian Government and Politics

इकाई 1 : भारतीय राष्ट्रीय आन्दोलन : 1858 का प्रथम स्वतन्त्रता संग्राम, असहयोग आन्दोलन, सविनय अवज्ञा आन्दोलन, भारत छोड़ो आन्दोलन । भारत का संविधानिक विकास : 1858, 1909,1919 और 1935 का भारत शासन अधिनियम ।

Unit 1 : Indian National Movement : First Independence Movement 1858, Non cooperation Movement, Civil Disobedience Movement and Quit India Movement.Constitutional Development of India : Govt. of India Act of 1858,1909, 1919 and 1935.

इकाई 2 : भारतीय संविधान : विशेषताएं , प्रस्तावना, स्त्रोत, । संघीय व्यवस्था , मौलिक अधिकार, मूल कर्तव्य,नीति निर्देशक तत्व । संविधान संशोधन प्रक्रिया ।

Unit 2 : Constitution of India : Characteristics, Preamble, Sources. Federal System. Fundamental Rights and Duties, Directive Principles of State Policy. Constitution Amendment Process.

इकाई 3 : संघीय कार्यपालिका : राष्ट्रपति, उपराष्ट्रपति, मन्त्रिपरिषद् और प्रधानमन्त्री । संघीय व्यवस्थापिका :संसद : लोकसभा और राज्यसभा । संसदीय प्रक्रिया ।

Unit 3 : Union Executive : President , Vice President, Council of MInisters and Prime MInister. Union Legislature : Parliament: Lok Sabha and Rajya Sabha. Parliamentary Procedure.

इकाई 4 : संघीय न्यायपालिका : सर्वोच्च न्यायालय : गठन, क्षेत्राधिकार, न्यायिक पुनरावलोकन, न्यायिक सक्रियतावाद । राज्य कार्यपालिका : राज्यपाल , मन्त्रिपरिषद् और मुख्यमन्त्री ।

Unit 4 : Union Judiciary : Supreme Court : Organisation, Jurisdiction, Judicial Review,Judicial Activism. State Executive : Governor, Council of Ministers and Chief Minister.

इकाई 5 : राज्य व्यवस्थापिका : विधानसंभा एवं विधानपरिषद् । निर्वाचन आयोग व चुनाव सुधार । राष्ट्रीय व क्षेत्रीय दल । भारतीय राजनीति के प्रमुख मुद्दे : जाति, धर्म, भाषा और क्षेत्र । पंचायती राज व्यवस्था।

Unit 5 : State Legislature : Legislative Assembly and Legislative Council. Election Commission and Election Reforms. National and Regional Parties. Major issues of Indian Politics : Caste, Religion, Language and Region. Panchayati Raj System.

संदर्भ पुस्तक (Reference Books)

8. डॉ. सुभाष कश्यप, भारत का संवैधानिक विकास और संविधान, हिन्दी माध्यम कार्यान्वय निदेशालय दिल्ली विश्वविद्यालय।
डॉ. सुभाष कश्यप, हमारी संसद, भारत की संसद एक परिचय, राष्ट्रीय पुस्तक न्यास।
10. डॉ. रूपा मंगलानी, भारतीय शासन एवं राजनीति, राजस्थान हिन्दी ग्रंथ अकादमी जयपुर।
11- M.V. Pylee , Constitutional History of India , S.Chand.
12- D.D. Basu Indian Constitution

27/6/19 27/6/19

B.A. – I[st] Year

MUSIC

Session- 2019-20

Note :- 1. B. A.(General) three year degree course with the relative weight of practical and theory being in the proportion 50 and 50 respectively (Model curriculum, page No.21A) courses. Hence the Central Board of Studies devide the ratio as :-

I[st] paper	40 marks (written or Theory) Revised as 50
2nd paper	40 marks (written or Theory) Revised as 50

Practical of 10 marks from which 10 marks are for the internal sessional work.
B.A. General (as one of the optional objccts).
Hindustain Music (Vocal +Instrumental..)

THEORY
PAPER - I
THEORY OF INDIAN MUSIC- VOCAL \INSTRUMENTAL (Paper Code-0131)

M.M. : 50

1. **Definition and Illustrations :-** Naad, Shruti, Swara, Saptak, Purvang, Uttarang, Vadi, Samvadi, Vivadi, Anuvadi, Alankar, That, Mind, Soota, Bol Alap, Tan, Tihai, pakad.

2. **General knowledge of the Musical Styles:-**
Dhrupad, Dhamar, khyal, Thumari, Tarana, Tappa, Hori, Chaturang, Geet, Bhajan, Ghazal,

3. General Knowledge of the biographies and the contributions of the following Musicians Ameer khusro, Swami Haridas, Tansen, Nayak Baiju, Nayak Gopal, Tyagraja.

4. Merits and Demerits of Musicians according to the Shastras.

5. **Study of the Theoritical details of prescribed Ragas for Practical Course as follows :-** Yaman, Bhupali, Allhaiya Bilawal, Bhairav, Kafi, Khamaj, Brindavani - sarang, Durga (Bilawal That).

14/06/19 14/06/19 14/06/19

THEORY

PAPER – II

THEORY OF INDIAN MUSIC- VOCAL /INSTRUMENTAL **M.M. : 50**

(Paper Code-0132)

SESSION – 2019-20

1. Hindustani Music and Karnatak Music, short history, similarities and Differences.
2. Study of Notation Systems - Bhatkhande and Paluskar Notation system.
3. Time Theory of the Ragas, Purva Raga, Uttar Raga, Sandhi Prakash Raga, Parmel Praveshak Ragas.
4. Formation of Ragas, Sampurna, Shadav, Audawa, Jati. That or Mel Theory.
5. Definition of Tala, Matra, Avartan, Bol, Vibhag, Khali, Bhari, Vilambit, Madhya and Drutlaya. Writing of the Talas in Notation with Dugan

PRACTICAL

M.M. : 50

1. Alankar (Palta)
2. Study of the following Ragas :- Yaman, Bhupali, Allahaiya Bilawal, Bhairav, Kafi, Khamaj, Brindavani Sarang, Durga (Bilawal That)
3. Two Vilambit Khyalas or Masitkhani Gat in any two of the above mentioned Ragas.
4. Madhya Laya Khyalas or Razakhani Gat with Alap, Tan, Tora Jhala, in any five of the above Ragas.
5. Lakshan Geet, Saragam Geet in all the above Ragas.
6. Ability to demonstrate (orally by giving Tali and Khali of on hand) Talas Prescribed in course as follows :- Dadra, Kaharva, Teen Tal, Ektal, Chautal, Jhaptal.
7. One Dhrupad or Dhamar / one Gat other than teen Tal (Composition only)
8. One Bhajan, Ghazal, Geet, Patrioteec song and prayer.

14/06/19

INTERNAL SCSSIONAL WORK -

1. Ten Descriptions of Music Programmes (Radio and T. V. personally attended)

RECOMMENDED BOOK -

1. Kramik Pustak Malika (Part I to Part IV) By pt. V.N. Bhatkhande.
2. Sangitanjali Part I to VI By Pt. Onkar Nath Thakur.
3. Sangeet Visharad (Hathras) By Vasant
4. Sangeet Bodh, By Dr. Sharad Chandra Paranjape
5. Dhawani aur Sangeet, by Prof. L. K. Sing
6. Tan Malika, by Raja Bhaiya Puchhwale
7. Hamare Sangeet Ratna, by Lakshmi Narayan Garg.
8. Rag Parichaya Part I to IV By Harish Chandra Shrivastava
9. All Journals and Magazenes of Music
10. Sitar Malika, (Hathras)
11. Tabla Vigyan, by Dr. Lalmani Misra
12. Swar aur Ragon ke Vikas me Vadyon ka Yogdan, By Prof. Indrani Chakrawarty.
13. Sangeet Manjusha By Prof. Indrani Chakrawarty.
14. Music - its methods and technique and teaching in Higher Education. By Prof. Indrani Chakrawarty.
15. Sangeetanjali Part I to V By Pt. Ramashraya Jha.

10/06/20

M A N A G E M E N T
Paper - I
PRINCIPLE OF MANAGEMENT
(Paper Code-0135)

Time : 3 HoursMax. **Marks : 75**

UNIT-I Evolution of Modern Industrial Organisation and Management Thought.

Industrial Revolation - Impact on society

Contribution - Frederic Winslow Taylor Eiton Moyo

- Douglas Mc. Gregor

The nature and scope of Management process definition of Management and Management process important characteristics of the process. The eight prepositions for effective organisation Philosophy, Urwick's Ten Principles, Different Schools of Thought.

UNIT-II Coordination - Definition and Meaning, Need and importance principles and Techni-ques.

Planning - Definition, Nature and purpose nature and process of forecasting.

Basic objective & Types of Plan - Objectives long and short range criteria of sound objectives.

- Types of Plans Decision making Meaning and basis for selecting alternatives.
- Strategies : Policies and Procedure.
- Qualities of Planning Process.

ORGANISATION

UNIT-III Nature, Importance, Components of Organisation,

Departmentation - Methods.

Span of Control - Wide and Narrow Spans.

Authority - Line and Staff, Decentralization, delegation, types of staff authority, factors determining the degree of decentralization.

Staffing : Nature and Importance.

Factors determining the selection of Managerial personnel.

Management Appraisals.

Development and Training of Managers.

UNIT-IV Deirection : Nature and importance of Communication.

Methods of building a communication net work.

Personal communication and use of orders.

Changing patterns of supervisory responsibility.

Factors of effective supervision

Selection and training of supervisors.

T.W.I. Programmes.
Nature and Importance of discipline.
Causes of Indiscipline.
Means of effective discipline.

UNIT-V Basic steps in control process.
Importance of Control.
Requirements for an effective control.
Purpose of Budgeting.
Types of budgets.
Elements of costs and types of costing.
Role of cost accounting.

BOOKS RECOMMENDED:

1. Koontz, Harold : Principles of Management
2. Chatterjee, S. S. : An Introduction to Management
3. Kast, Fremont E. : Organisation Management
4. Asthena G. P. : The Ground Work of Management.
5. डॉ गुप्ता : व्यवसाय प्रशासन एवं प्रबंध
6. डॉ. आर. सी. सक्सेना : व्यवसाय प्रशासन एवं प्रबंध
7. Dr. K. N. Dinesh : Structure of Medium Scale Industries.

Paper-II
COMMERCIAL ACCOUNTANCY
(Paper Code-0136)

Max. Marks : 75

UNIT-1 Definition and objects of book-keeping, principle of Double Entry, its object sand advatages.

Journal Simple journal enatries,compound journal entries rules for recording journ.

UNIT-2 Ledger &ledger account, positing of journal entries, types of ledger accounts Balancing of ledger accounts Cash book:Cash book with cash and discount columns three column or cash book, petty cash book.

UNIT-3 Bank reconciliation statement.

Bill Transaction.

Endorsement of Bill

Dishonourment of Bill

Accomodation Bill

UNIT-4 1. TrialBalance.

2. Rectification oferrors

3. Capital

andrevenueexpenditure. **UNIT-5 Final**

Accounts:

1. Manufacturing accountstrading
2. Profit and lossaccount
3. Balance Sheet.

BOOKS RECOMMENDED:

1.	M.M.Shah	:	Double entry Bookkeeping
2.	R.R.Gupta	:	Book keeping &Accounts.
3.	T.S.Grewal	:	Introduction toaccountancy.
4.	Juneja, Chawla &Saksena:		ElementaryBook-keeping.
5.	Karim&Khanuja	:	FinancialAccounting

B.A./B.Sc. – First Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - First

Name of the Paper :- FOUNDATION OF ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Anthropology. History of Anthropology. Branches of Anthropology -

(a) Socio-cultural Anthropology
(b) Physical Biological Anthropology
(c) Archaeological Anthropology
(d) Linguistic Anthropology

UNIT – II Relationship of Anthropology with other disciplines: Life Sciences, Medical Sciences, Social Sciences: History, Economics, Sociology, Psychology, Political Science

UNIT – III Foundation in Biological Anthropology

(a) Human Evolution with respect to Hominid fossils
(b) Human Variation: Types and causes
(c) Human Genetics: Concept, scope and branches
(d) Human growth and development: Definition, scope, methods and factors effecting human growth and development

UNIT – IV Fundamentals in Social-Cultural Anthropology.

(a) Culture, Society, Community, Group, Institution
(b) Human Institution:-
Family: Definiton, types and function of family
Marriage: Definition, forms of marriage and its functions
Kinship: Definition, types and functions
Religion: Theories on the origin of religion
(c) Basic techniques of data collection :
Observation , Schedule, Questionnaire, Geneology

UNIT – V Fundamentals in Archaeological Anthropology.

(a) Tool typology & Technology: Paleolithic, Mesolithic & Neolithic
(b) Cultural evolution: Broad outlines of cultures (Stone age to metal age)
(c) Dating techniques in archaeology

20/06/19

B.A. /B.Sc. – First Year

Session: 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	PHYSICAL/ BIOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning, scope, History of Physical Anthropology & its applied aspects
Theories of organic evolution: Lamarckism, Neo-lamarckism, Darwinism, Neo-darwinism & Synthetic theory of evolution

UNIT – II Position of Man in animal kingdom, Classification of living primates, Comparative anatomy of Man and Apes (with special reference to skull, pelvis, dentition and long bones)

UNIT – III Fossil evidence of human evolution: Ramapithecus, Australopithecus, Pithecanthropus, Sinanthropus, Neanderthal, Cromagnon, Grimaldi man, Chancelade man.

UNIT – IV Concept of Race: Race formation and Criteria of racial classification, UNESCO Statement, Racial element in India, Major races of the world.

UNIT – V Human Genetics:

a. Structure of Chromosome, DNA & RNA

b. Mendelian principle.

c. Types of Inheritance in Human

20/06/19

B.A./B.Sc. – First Year

Session : 2018-19

Name of the Subject	:-	Anthropology
Paper	: -	Practical
Name of the Paper	:-	OSTEOLOGY AND CRANIOMETRY

Total Marks : 50 Pass Marks : 17

I. Identification of bones of human Skeleton. Sketching and labeling of various normas of skull, Overview of Pectoral & Pelvic girdles, Femur & Humerus bone

II. Craniometry :-
1. Maximum Cranial length.
2. Maximum Cranial Breadth.
3. Maximum frontal Breadth.
4. Bizygomatic Breadth.
5. Nasal Height.
6. Nasal Breadth
7. Minimum frontal breadth
8. Bimaxillary Breadth.
9. Maximum Biorbital Breadth
10. Length of magnum foramen.

III. Craniometric indices :
1. Cranial Index
2. Nasal Index

20/06/19

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.A. Part-I
MATHEMATICS
PAPER - I
ALGEBRA AND TRIGONOMETRY

UNIT-I Elementary operations on matrices, Inverse of a matrix. Linear independence of row and column matrices, Row rank, column rank and rank of a matrix. Equivalence of column and row ranks. Eigenvalues, eigenvectors and the characteristic equations of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

UNIT-II Application of matrices to a system of linear (both homogeneous and nonhomogeneous) equations. Theorems on consistency of a system of linear equations. Relation between the roots and coefficients of general polynomial equations in one variable. Transformation of equations. Descarte's rule of signs. Solutions of cubic equations (Cardons method), Biquadratic equation.

UNIT-III Mappings, Equivalence relations and partitions. Congruence modulo n. Definition of a group with examples and simple properties. Subgroups, generation of groups, cyclic groups, coset decomposition, Lagrange's theorem and its consequences. Fermat's and Euler's theorems. Normal subgroups. Quotient group, Permutation groups. Even and odd permutations. The alternating groups An. Cayley's theorem.

UNIT-IV Homomorphism and Isomorphism of groups. The fundamental theorems of homomorphism. Introduction, properties and examples of rings, Subrings, Integral domain and fields Characteristic of a ring and Field.

TRIGONOMETRY :

UNIT-V De-Moivre's theorem and its applications. Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantity. Expansion of trigonometrical functions. Gregory's series. Summation of series.

TEXT BOOK :

1. I.N. Herstein, Topies in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd.New Delhi, 2000.
3. Chandrika Prasad, Text-Book on Algebra and Theory of equations, Pothishala Private Ltd., Allahabad.
4. S.L. Loney, Plane Trigonometry Part II, Macmillan and Company, London.

REFERENCES :

1. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, First Course in linear Algebra, Wiley Eastern, New Delhi, 1983.
2. P.B. Bhattacharya, S.K.Jain and S.R. Nagpaul, Basic Abstract Algebra (2 edition), Cambridge University Press, Indian Edition, 1997.
3. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic linear Algebra with MATLAB, Key College Publishing (Springer-Verlag), 2001.
4. H.S. Hall and S.R. Knight, Higher Algebra, H.M. Publications, 1994.
5. R.S. Verma and K.S. Shukla, Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.

B.A. Part-I
MATHEMATICS
PAPER - II
CALCULUS

DIFFERENTIAL CALCULUS:

UNIT-I $\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuties. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

UNIT-II Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in cartesian and polar coordinates.

INTEGRAL CALCULUS:

UNIT-III Integration of transcendental functions. Reduction formulae. Definite integrals. Quadrature. Rectification. Volumes and surfaces of solids of revolution.

ORDINARY DIFFERENTIAL EQUATIONS:

UNIT-IV Degree and order of a differential equation. Equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

UNIT-V Linear differential equations of second order. Transformation of the equation by changing the dependent variable/the independent variable. Method of variation of parameters. Ordinary simultaneous differential equations.

TEXT BOOK :

1. Gorakh Prasad, Differential Calculaus, Pothishala Private Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad.
3. D.A. Murray Introductory Course in Differential Equations, Orient Longman (India), 1976.

REFERENCES :

1. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's outline series, Schaum Publishing Co. New York.
3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
4. P.K. Jain and S.K. Kaushik, An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
5. G.F. Simmons, Differential Equations, Tata Mc Graw Hill, 1972.
6. E.A. Codington, An Introduction to Ordinary Differential Equations, Prentics Hall of India, 1961.
7. H.T.H. Piaggio, Elementary Treatise on Differential Equations and their Applications, C.B.S. Publishe & Distributors, Dehli, 1985.
8. W.E. Boyce and P.O. Diprima, Elementary Differential Equations and Boundary Value Problems, John Wiley, 1986.

12. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley and Sons, 1999.

B.A. Part-I

MATHEMATICS

PAPER - III

VECTOR ANALYSIS AND GEOMETRY

VECTOR ANALYSIS:

UNIT-I Scalar and vector product of three vectors. Product of four vectors. Reciprocal Vectors. Vector differentiation. Gradient, divergence and curl.

UNIT-II Vector integration. Theorems of Gauss, Green, Stokes and problems based on these.

UNIT-III General equation of second degree. Tracing of conics. System of conics. Confocal conics. Polar equation of a conic.

UNIT-IV Sphere. Cone. Cylinder.

UNIT-V Central Conicoids. Paraboloids. Plane sections of conicoids. Generating lines. Confocal Conicoids. Reduction of second degree equations.

TEXT BOOKS:

1. N. Saran and S.N. Nigam, Introduction to vector Analysis, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry, Pothishala Pvt. Ltd., Allahabad.
3. R.J.T. Bell, Elementary Treatise on Coordinate Geometry of three dimensions, Machmillan India Ltd. 1994.

REFERENCES:

1. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2. Murray R. Spiegel, Vector Analysis, Schaum Publishing Company, New York.
3. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, 1999.
4. Shanti Narayan, A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
5. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, london.
6. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd., 1994.
7. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of three Dimensions, Wiley Eastern Ltd., 1999.
8. N. Saran and R.S. Gupta, Analytical Geometry of three Dimensions, Pothishala Pvt. Ltd. Allahabad.

भाषाविज्ञान
प्रथम प्रश्न पत्र
भाषा की प्रकृति
(पेपर कोड – 0107)

1. भाषा–मानव एवं मानवेत्तर, संप्रेषण, परिभाषा, विशेषताएं, भाषा विज्ञान की उपयोगिता, भाषा विज्ञान की विभिन्न शाखाएं, भाषा विज्ञान का अन्य विषयों के साथ संबंध ।
2. भाषा सीखने की प्रक्रिया – मौखिक एवं लिखित भाषा के विविध रूप, भाषा बोली के भाषा बन जाने के कारण, भाषाई परिवर्तन के प्रकार एवं कारण ।
3. मनोभाषाविज्ञान –भाषा एवं मस्तिष्क, मस्तिष्क में भाषा के अवयय, स्थानीयकरण, भाषित व्यतिक्रम अस्पष्टार्थकता, अनकार्थकता ।
4. भाषा एवं विचार – भाषा – सामार्थ्य एवं भाषा–व्यवहार, सहजात परिकल्पना, निश्चयवाद – अनुभववाद।
5. हिन्दी भाषा का उद्‌भव और विकास, हिन्दी की उपभाषाएं तथा विविध बोलियां छत्तीसगढ़ी की विशेषताएं ।

निर्धारित पुस्तकें –

1. सैद्धांतिक भाषाविज्ञान – जे. लियांस (अनवाद– सत्यकाम वर्मा)
2. सामान्य भाषाविज्ञान – रॉबिंस
3. सामान्य भाषाविज्ञान – बाबूराम सक्सेना
4. भाषाविज्ञान – भोलानाथ तिवारी
5. भाषा , विचार और वास्तविकता – बेंजामिन ली होर्फ
6. भाषाविज्ञान – राजमल बोरा
7. भाषा विज्ञान सैद्धांतिक चितंन – रविन्द्रनाथ श्रीवास्तव

8- Philosophy of Language and – S. Chopman, Routledge, London.
9- An Introduction to Language and – A. Akimajian (etal.)
10- Communication – Met Press Massachusetts, 1990/1996

(Indian Repoint] Prentice Hall] 1996)

द्वितीय प्रश्न पत्र
ध्वनि और शब्द अभिरचना
(पेपर कोड – 0108)

1. ध्वनि विज्ञान –स्वरूप एवं शाखाएं, वाग्यंत्र की संरचना एवं कार्य, स्वर तथा व्यंजन की परिभाषा एवं अंतर।
2. स्वर – वर्गीकरण के विभिन्न आधार, मान स्वर – त्रिकोण, प्रधान एवं गौण मान संध्यक्षर (संयुक्त स्वर)
3. व्यंजन– वर्गीकरण के विभिन्न आधार, संयुक्त व्यंजन, अंतर्राष्ट्रीय ध्वन्मात्मक प्रतिलिति चिह्न (आई.पी.ए.)
4. अक्षर एवं ध्वनि गुण – मात्रा, बलाघात, सुर अनुतान (सुर लहर), संग्रम, व्यतिरेकी विवरण, परिपूरक विवरण सह स्वनों का निर्धारण ।
5. शब्द परिभाषा, वर्गीकरण, हिन्दी में आगत शब्दावली, शब्द समूह में परिवर्तन –कारण एवं दिशाएं (प्रकार)

निधार्रित पुस्तकें –

1. ध्वनि विज्ञान – गोलोक बिहारी धल
2. स्वन विज्ञान – चतुर्भुज सहाय
3. भाषा विज्ञान – भोलानाथ तिवारी
4. शब्दों का अध्ययन – भोलानाथ तिवारी
5. हिन्दी का नवीनतम बीज –व्याकरण – रमेश चंद्र महरोत्रा एवं चित्तरंजन कर
6. Linguidyice : An Introduction – A. Rad Ford (end al.), Cambridge University Press, 1999
7. A Course in Phonetics - P. Lodefoged, Hardcourt Brace Jovanovich New York, 1993.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

संशोधित पाठ्यक्रम – बी.ए. प्रथम वर्ष के अंतर्गत

सत्र 2019 – 20

विषय – नृत्य (भरत नाट्यम)

बी.ए. भाग (1) के लिये इस विषय में प्रायोगिक और सैद्धांतिक दो भाग होगें। प्रायोगिक 50 अंक एवं सैद्धांतिक 100 अंक का होगा। इस हेतु 50–50 अंक के दो प्रश्नपत्र होंगे। प्रत्येक वर्ष के पूर्णांक कुल मिलाकर 150 अंक के होगें।

क्र	विवरण		पूर्णांक	उत्तीर्णांक
1	सैद्धांतिक प्रथम प्रश्न पत्र	–	50	17
2	सैद्धांतिक द्वितीय प्रश्न पत्र	–	50	17
3	प्रायोगिक	–	50	17
		योग	**150**	**51**

सैद्धांतिक (विस्तृत पाठ्यक्रम)

प्रथम प्रश्न पत्र

शीर्षक – नृत्य का इतिहास एवं सामान्य अध्ययन

पेपर कोड (0153)

1. **नृत्य का इतिहास** – सिंधु सभ्यता, वैदिक काल, रामायण एवं महाभारत काल में नृत्य की स्थिति।
2. **पुराणों के आधार पर** – उमाशंकर एवं नटवर श्री कृष्ण की नृत्य संबंधी कथायें – त्रिपुरडाह, उमा तांडव, मोहिनी–भस्मासुर, माखन लीला, कालिया दमन, रासलीला।
3. **नृत्य का अन्य ललित कलाओं से संबंध** – संगीत, साहित्य, चित्रकला एवं मूर्तिकला से संबंध।
4. **नाट्य की उत्पत्ति कथा** – भरत के नाट्यशास्त्र के प्रथम अध्याय में वर्णित।
5. **लोकधर्मी नाट्य परंपरा** – निम्न की संक्षिप्त जानकारी –
   1. रामलीला
   2. रासलीला
   3. भवाई
   4. माच

14/06/19 14/06/19 14/06/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

सैद्धांतिक (विस्तृत पाठ्यक्रम)

सत्र 2019 – 20

द्वितीय प्रश्न पत्र

शीर्षक – शास्त्रीय नृत्य सिद्धान्त

पेपर कोड (0154)

1.	**ताल की प्रांरभिक जानकारी**	–	1. ताल के दस प्राण। 2. लय – विलंबित, मध्य एवं द्रुत लय।
2.	**संक्षिप्त जीवन परिचय**	–	भरत मुनि, आचार्य नंदिकेश्वर।
3.	**नृत्य के अभ्यास से शारीरिक एवं मानसिक लाभ।**		
4.	**भारतीय नाट्य परंपरा में गुरूवंदना का महत्व।**		
5.	**छत्तीसगढ़ी नृत्यों का सामान्य परिचय**	–	1. करमा 2. ददरिया 3. सुवा 4. रीना, परब

<u>प्रायोगिक</u>

1. मौखिक मुद्रा प्रदर्शन – (अभिनय दर्पण के अनुसार)
   (1) शिवस्तुति (2) शिरोभेद (3) ग्रीवाभेद
   (4) दृष्टिभेद (5) असंयुक्त हस्त (6) संयुक्त हस्त

2. कार्यक्रम विभाग –
   (1) शारीरिक अभ्यास
   (2) आरंभिक –05 अड़ऊ भेद
   (पद + हस्त संचालन तीन काल में)
   (3) पूजा नृत्य
   (4) अलारिपु (तिस्त्रजाति)

14/06/19 14/06/19 14/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A. /B.Sc. –I
Subject-Statistics
Paper – I (Paper Code-0803)
PROBABILITY THEORY

Unit-I
Important concepts in probability: Random experiment: trial, sample point and sample space, event, Operations of events, concepts of mutually exclusive and exhaustive events. Definition of probability: classical and relative frequency approach. Richard Von Misses, Cramer and Kolmogrove approachesto probability, merits and demerits to these approaches, any general idea to be given. Discrete probability space, Properties of probability based on axiomatic approaches, Independence of events, Conditional probability, total and compound probability rules, Baye's theorem and its applications.

Unit-II
Random variables: Definition of discrete random variable (rv); probability mass function (pmf) and cumulative distribution function (cdf). Joint pmf of several discrete rvs. Marginal and conditional pmfs. Independence of rvs. Idea of continuous random variables, probability density function, illustration of random variables and its properties. Expectation of a random variable and its properties -moments, measures of location and dispersion, skewness and kurtosis, Moment generating function, raw and central moments, Probability generating function (pgf) and, their properties and uses.

Unit-III
Standard univariate discrete distributions: degenerate, discrete uniform, hypergeometric, Poisson, geometric and negative binomial distributions. Marginal and conditional distributions, Distributions of functions of discrete rvs, reproductive property of standard distributions.

Unit-IV
Univariate continuous distributions and their properties: Uniform, Beta, Gamma, Exponential, Normal, Cauchy, Lognormal. Moment generating function (mgf) : its properties and applications.
Tchebycheff's inequality and applications, statements and applications of weak law of large numbers and central limit theorems.

Unit-V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.
2.Chung, K.L. (1979). Elementary Probability Theory with Stochastic Processes, Springer International Student Edition.
3. Edward P.J., Ford J.S. and Lin (1974): Probability for Statistical Decision-Marketing. Prentice Hall
4. Goon A.M., Gupta M.K. and Dasgupta B.(1999): Fundamentals of Statistics, Vol. I , World Press, Calcutta
5. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, Mc. Graw Hall.

ADDITIONAl REFERENCES:

6. Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.
7.David Stirzaker (1994). Elementary Probability, Cambridge University Press.
8.Feller, W. (1968). An Introduction to Probability Theory and its Applications, Wiley.
9. Hoel P.G. (1971): Introduction to Mathematical Statistics
10. Mayer P.L. (1970): Introductory Probability and Statistical Applications, Addition Wesley
11.Mukhopadhyay, P. (1996). Mathematical Statistics, New Central Book Agency, Calcutta.
12.Parzen, E. (1960). Modern Probability Theory and its Applications, Wiley Eastern.
13Pitman, Jim (1993). Probability, Narosa Publishing House.

Paper – II(Paper Code-0804)
DESCRIPTIVE STATISTICS

Unit - I

Origin and Development of statistical importance, uses and limitations of Statistics. Types of Data: Concepts of a statistics population and sample from a population; qualitative and quantitative data; nominal and ordinal data; cross sectional and time series data; discrete and continuous data; frequency and non-frequency data.

Collection and Scrutiny of Data; Primary data – designing a questionnaire and a schedule; checking their consistency. Secondary data – their major sources including some government publications. Complete enumeration, controlled experiments, observational studies and sample surveys. Scrutiny of data for internal consistency and detection of errors of recording. Ideas of cross-validation.

Presentation of Data: Construction of tables with one or more factors of classification. Diagrammatic and graphical representation of non-frequency data. Frequency distributions, cumulative frequency distributions and their graphical and diagrammatic representation – column diagram, histogram, frequency polygon and ogives. Stem and leaf chart. Box plot.

Unit -II

Analysis of Quantitative Data: Univariate data: Concepts of central tendency or location, and their measures; arithmetic, geometric and harmonic mean, median and mode.

Unit -III

Dispersion and relative measures of dispersion, skewness and kurtosis, and their measures including those based on quartiles and moments. Sheppard's corrections for moments for grouped data (without deviation).

Unit -IV

Bivariate data: Scatter diagram. Product moment correlation coefficient and its properties. Coefficient of determination. Correlation ratio. Concepts of regression. intra - class correlation coefficient with equal and unequal group sizes. Rank correlation – Spearman's and Kendall's measures. Correlation index. Principle of least squares. Fitting of linear and quadratic regression and related results. Fitting of curves reducible to polynomials by log and inverse transformation. Multivariate data: Multiple regression, multiple correlation and partial correlation in 3 variables. Their measures and related results.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.

2.Croxton FE, Cowden DJ and Klein S: Applied General Statistics (1973): Prentice Hall of India.

3.Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Vol. 1(1991) & Vol. 2(2001). World Press, Calcutta.

5.Gupta V.K. and Kapor S.C. : Fundamentals of Mathematical Statistics S. Chand and Sons.

ADDITIONAl REFERENCES:

6.Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.

7. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, McGraw Hill.

8.Snedecor GW and Cochran WG: Statistical Methods (1967) : Lowa State University Press.

9.Spiegel, MR (1967): Theory & Problems of Statistics (1967): Schaum's Publishing Series.

Paper III

Practical: Practical Based on Paper I & II

1. Presentation of data by Frequency tables, diagrams and graphs.
2. Calculation of Measures of Central Tendency, dispersion , skewness and kurtosis
3. Product Moment Correlation and Correlation Ratio
4. Fitting of Curves by the least square method
5. Regression of two variables
6. Spearman's Rank correlation Coefficient
7. Multiple regression of three variables
8. Multiple correlation and partial correlation
9. Evaluation of probabilities using addition and multiplication theorems, conditional probabilities and Bayes theorems
10. Exercises on mathematical expectations and finding measures of central tendency, dispersion, skewness and kurtosis of univariate probability distributions
11. Fitting of univariate and conditional distributions

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व
Ancient India History, Culture and Archaeology

बी.ए. प्रथम वर्ष

B.A. Part I Year

पाठ्यक्रम
Syllabus

सत्र : 2019–20

Session 2019-20

बी.ए. प्रथम वर्ष

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व

प्रथम : प्रश्न–पत्र

B.A. Part I Paper I

भारत का राजनीतिक इतिहास (पेपर कोड 0133)

(हड़प्पा संस्कृति से 319 ई. तक)

Political History of India (Harappa Culture to 319 A.D.)

पूर्णांक : 75

उद्देश्य : इस पाठ्यक्रम का उद्देश्य छात्रों को संबंधित कालखण्ड के राजनीतिक इतिहास की समुचित जानकारी देना है।

इकाई– 1 (1) प्राचीन भारतीय इतिहास के स्रोत (Sources of Ancient Indian History)
(2) हड़प्पा तथा समकालीन ताम्राश्म संस्कृतियॉ (Harappa and Contemporary Chalcolithic Culture)
(3) वैदिक युग (Vedic Age)

इकाई– 2 (1) महाजन पद युग (Mahajanpada Age)
(2) मगध साम्राज्य का उत्कर्ष (Rise of Magadha Kingdom)

इकाई– 3 (1) सिकन्दर का आक्रमण और उसके प्रभाव (Alexander's Invasion and it's impact)
(2) मौर्य साम्राज्य का उत्थान और उसके प्रभाव (Rise of Mauryan empire and its impact)

इकाई– 4 (1) हिन्द–यूनानी (Indo-Greeks)
(2) शुंग (Shungas)
(3) सातवाहन (Satvahanas)
(4) शक–क्षत्रप, पार्थियन (Shak-Kshatrapas, Parthiyan)
(5) खारवेल (Kharvela)

इकाई– 5 (1) संगम युग (Sangam Age)
(2) कुषाण (Kushanas)
(3) मालव, यौधेय, अर्जुनायन तथा औदुम्बर (Malavas, Youdheyas, Arjunayana and Audumbara)
(4) नागवंश (Nagas)

सहायक ग्रंथ :

1. एच.सी. रायचौधरी – प्राचीन भारत का राजनीतिक इतिहास
2. के.ए. नीलकंठ शास्त्री – दक्षिण भारत का इतिहास
3. कृष्णदत्त बाजपेयी तथा विमलचंन्द्र पांडेय – प्राचीन भारत का इतिहास
4. विमल चन्द्र पांडेय – प्राचीन भारत का राजनीति तथा सांस्कृतिक इतिहास भाग एक
5. किरन कुमार थप्याल – सैंधव सभ्यता
6. गुलाम, याजदानी (संपा.) – दकन का इतिहास
7. राजबली पाण्डेय – प्राचीन भारत
8. H.C. Roycoudhary - Political History of Ancient India
9. R.C. Majumdar (Ed.) - The Age of Imperial Unity
10. Romila Thaper - History of India
11. K.A, Nilkanta Shastry - History of South India
12. व्ही.डी.झा. सुष्मिता पाण्डेय, डॉ.ओम प्रकाश – Ashoka and the declaim of Moury empire

बी.ए. प्रथम वर्ष

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व

प्रथम : प्रश्न–पत्र

B.A. Part I Paper II

भारत का राजनीतिक इतिहास (319 ई.से 1300 ई. सन् तक)

Political History of India (From 319 A.D. to 1300 A.D.)

पूर्णांक : 75

उद्देश्य : इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को संबंधित कालखण्ड के राजनीतिक इतिहास का समुचित ज्ञान प्रदान करना है।

इकाई– 1 (1) गुप्तों की उत्पत्ति एवं प्रारंभिक इतिहास (Rise of Guptas and their early History)
(2) चन्द्रगुप्त प्रथम, रामगुप्त, समुद्रगुप्त (Chandragupta – I, Ramagupta, Samudragupta)
(3) कुमारगुप्त प्रथम, स्कन्दगुप्त (Kumargupta – I, Shandgupta)
(4) वाकाटक राजवंश, गुप्त–वाकाटक सम्बन्ध (Vakataka Dynasty, Gupta Vakataka relation)

इकाई– 2 (1) परवर्ती गुप्त राजवंश (Later Gupta Rulers)
(2) मौखरी (Maukharis)
(3) वर्धन राजवंश और हर्ष का प्रशासन (Vardhana Dynasty and Administration of Harsha)

इकाई– 3 (1) बादामी के चालुक्य (Chalukyas of Badami)
(2) कांची के पल्लव (Pallavas of Kanchi)
(3) चोल तथा उनका प्रशासन (Cholas and their administration)

इकाई– 4 (1) गुर्जर प्रतिहार (Gurjara Pratihara)
(2) राष्ट्रकूट (Rashtrakutas)
(3) पाल (Palas)
(4) गाहड़वाल (Gahadwalas)

इकाई– 5 (1) चन्देल (Chandela)
(2) परमार (Parmaras)
(3) चाहमान (Chahmanas)
(4) त्रिपुरी के कलचुरि (Kalachuris of Tripuri)
(5) रतनपुर के कलचुरि (Kalachuris of Ratanpur)

अनुशंशित पुस्तके :

1. उदयनारायण राय – गुप्त राजवंश तथा उसका इतिहास (नया संस्करण) 1988
2. श्री राम गोयल – भारत का राजनैतिक इतिहास भाग 2 एवं 3
3. श्री राम गोयल – गुप्त साम्राज्य का इतिहास
4. Ashvini Agrawal - Rise and Fall of the imperial Gupta
5. विशुद्धानंद पाठक – उत्तर भारत का राजनीतिक इतिहास
6. अवध बिहारी लाल अवस्थी – राजपूत राजवंश
7. डी.सी.गांगुली – परमार राजवंश
8. भगवती प्रसाद पांथरी – मौखरी और पुष्यभूमि राजवंश
9. डॉ.के.ए.नीलकंठ शास्त्री – दक्षिण भारत का इतिहास
10. डॉ.बैजनाथ शर्मा – हर्षवर्धन
11. R.C. Majumdar & A.D. Pusalkar (Ed.) - The Classicale Age "The age of Imperial Unity" The Strangle for Empire
12. Majumdar, Roy Choudhary - An Advanced History of India Vol. I

DEFENCE - STUDIES

PAPER - I

INDIAN MILITARY HISRORY M.M. 50

(Paper Code-0143)

AIM : The main idea behind this paper is to give a conceptual background about the events and factors which infleenced course of history and helped in developing the art of war in India.

Note : Questions will be set from each unit, There will be only internal choice.

UNIT-1 1. The definition and scope of Defence Studies and its relationship with other sub-jects.

2. Art of war of Epic and Puranic period.
3. Comparative study of lndo-Greek art of war with special reference to the Battle of Hydaspus 326 B.C.
4. Mauryan Military system and art of war.

UNIT-2 1. Kautilya's Philosophy of war.

2. Gupta's military system and art of war.
3. Military system of Harshavardhan.
4. Dicline of Chariots and Importance of Elephant and Cavalory.

UNIT-3 1. Mughal military system.

2. Rajput and Turk pattern of warfare with specil of reference to Battle of Somnath and Battle of Tarain up to 12th century A.D.
3. Causes of the fall pf Rajput Military system.
4. Army organization during Sultanate period.
5. Battle of Panipat 1526 A.D. and Battle of Haldighati 1576 A.D.

UNIT-4 1. Maratha Military system.

2. Warfare of Shivaji.
3. Battle of Assaye 1803 A.D.
4. Sikh Military system.
5. Battle of Sobraon 1846 A.D

UNIT-5 1. 1857 Liberation Movement.

2. Reorganizations of Indian Army under the Crown.
3. Nationalization of, Indian Army after independence.
4. Military reforms of Lord Kitchner's.

READING LIST :

1.	Military System of Anciant India	:	B.K. Majumdar
2.	Generalship of Alexander the Great	:	J.F.C.Fuller
3.	Kautilya Arthashastra	:	K.P. Kanbley
4:	Military history of India	:	J.N. Sarkar

PAPER - II

DEFENCE MECHANISM OF THE MODERN STATE

(Paper Code-0144)

AIM : To enable students to appreciate the importance of higher political direction in the for-mulation of national defence policy and roles as political and military leadership in fur-thering national security.

Note : Question will be from each unit, there will be only internal choice.

UNIT-1 1. Evolution of National defence policy.

2. Inter dependence of Foreign, Defence and Economics policies.
3. Higher defence organization of U.S.A., U.K. and RUSSIA.
4. Higher defence organization of CHINA, PAKISTAN and NATO.

UNIT-2 1. Higher defence organization in India.

2. Powers of President and relation to Armed forces.
3. Parliament and the Armed forces.
4. Defence (Political affair) committee of the cabinet. Its composition, methods of working during war and peace.
5. National Defence Council and its Valiant.

UNIT-3 1. Organization of Ministry of Defence.

2. Organization of Army head quarter.
3. Organization of Naval head quarter.
4. Orgatiization of Air head quarter.

UNIT-4 1. Organization and role of Para-militaty forces - B.S.F., I.T.B.P., C.I.S.F. etc.

2. Organization and role of Intelligence Agencies - RAW, CBI, CID., IB etc.
3. Military Intelligence.
4. Role of N.C.C. in preparing youth for Defence services.

UNIT-5 1. Organization of Civil - defence.

2. Importance and role of civil defence during war and peace.
3. Air-Raid signal and precaution before and after bombardment.
3. Role of Indian armed forces in war and peace.

READING LIST :

1. Indian Army, A Sketch of its History & Organisation : E.H.E. Choen
2. Defence Organization in India : Venkateshwarm

PRACTICAL **M.M. : 50**

There shall be practicall examination ot 3 hours duration and carying 50 marks. The distri- bution of marks shall be as follows -

1. Exercises based on Map reading : 20 Marks
2. Exercises based on models : 10 Marks
3. Sessional Work and Record : 10 marks
4. Viva-Voce : 10 marks,

PART - A

ELEMENTARY MAP READING

1. Maps- Difination, types, Marginal Information.
2. Conventional signs - Military and Geographical.
3. Direction and cardinal points.
4. Types of North, Angle of Convergence.
5. Study of Liquid compass, its parts, various tactical uses and preparation of Night navigation chart.
6. service Protractor and its uses.
7. To find North by Compass, Watch, Sun, Stars etc.
8. Bearing and interconversion of bearing.
9. Setting of Map.
10. Grid System.

PART - B

RECOGNITION & ELEMENTRY STUDY OF FOLLOWING MODELS

1. equivalent Rank and Badges of Indian Army, Navy and Air Force.
2. Famous Armoured vehicles used in war.
3. Weapons used in Infantry.
4. Various Ships of Indian Navy.
5. Famous Air-Crafts Used by Air-Force.

पाठ्यक्रम उर्दू निसाब

नोट : इस इम्तेहान में दो पर्चे में 75 नम्बर पर मुशतमिल होगा।

1. नस्र
2. नज्म

पहला पर्चा
नस्र(पेपर कोड– 0129)
(सवानेह, खाके, इन्शाईये)

निसाब

1. सवानेह :

1. गालिब के सवानेही हालात –' यादगारे गालिब ' के मुसन्निक अल्लाफ हुसैन हाली
2. शिब्ली की बेनियाजी और खुद्दारी शिब्ली ' से सैयद सुलेमान नदवी
3. नजीर अहमद की कहानी : ' कुछ मेरी, कुछ उनकी जबानी ' मुसन्निव फरहत उल्ला बेग

2. खाके :

1. नामदेव माली : चन्द्र हम अस्र से मुसन्निव मौलवा अब्दुल हक
2. हकीम अजमल खां : 'खिमालिस्तान ' सज्जाद हदर यलद्रम'
3. अकबर इलाहाबादी :इन्शाएं माजिद हिस्सा–2 मुसन्निफ अब्दुल माजिद दरयावादी
4. जिगर साहब : 'सहाब' से मुसन्निफ मोहम्मद तुफैल
5. मौलाना अब्बुल कालाम आजाद : 'अब्बुल कालाम आजाद' से मुसन्निफ ख्वाजा सहन निकामी

3. इन्शाईये :

1. तास्सुब : 'मजामीने सर सैयद' सर सैयद
2. मुझे मेरे दोस्तों से बचाओ : 'खिमालिस्तान' सज्जाद हदर यलद्रम
3. शहजादे का बाजार में घिसटना : गदरे देहली के अफसाने सुसन्निफ सहन निजामी
4. स्बेरे जो कल आंख मेरी खुली : 'मजामीने पितरस' अज पितरस बुखारी
5. बरसात : निगारिस्तान अज नियाज फतहपूरी
6. शायर होना क्या माने रखना है : अज रशीद अहमद सिद्दीकी

पर्चा प्रथम

नोट : मुन्दरजा बाला पर्चा पांच इकाईयों में तफसीम होगा ।

इकाई–1

1. सवाने, निगारी, खाका निगारी और इन्शाईया निगारी पर सवालात 15 नंबर
2. शामिले निशाब हसबाफ पर सवाल 15 नंबर
3. शामिले निशाब खाकों पर सवालात 15 नंबर
4. शामिले निशाबइन्शाईयों पर सवालात 15 नंबर
5. शामिले निशाब असबाफ सवानेही और इन्शाईयों में इक्तेबायात की तशरीह 15 नंबर

पर्चाद्वितीय (शायरी)
गजलियात
(पेपर कोड – 0130)

निसाब :

(1) बली :

1. याद करना हर घड़ी उस यार का
2. शराबे शौक से सरशार हैं हम

(2) मीर तरी मीर :

1. उल्टी हो गई सब तदवीरें
2. मुहं तकाही करें है जिस तिस का

(3) गालीब :

1. दिल ही ताक है न संगो खिश्त दर्द से भर आये क्यो
2. यह न थी हमारे किस्मत के विसाले यार होता

(4) मौमिन :

1. अगर उसकी जरा नहीं होता
2. गैरो पर खुल न जाएं कही राज देखना

(5) आतिश :

1. मगर उसको फरेबे नर्गिये मस्ताना आता है
2. हवाएं दौरे गए खुशगवार राह में है

(6) दाग देहलावी :

1. खातिर से या खअयाल से मैं मान तो गया
2. गाब किया तेरे बादे पे एतेवार किया

(7) सिरज मिर खां सैहर

1. सोने में दिल है दिल में दाग
2. वक्ते जिबाह मुहं फिर गया शमशीरे कातिल का

(8) डॉ. इकबाल

1. कभी ये हकीकते मुसुन्तजिर नजर आ लिबाजे गजाज
2. फिर चरागे लाबा से रोशन हुए कोहो दमन

(9) हसरत मौहानी

1. रस्मे जफा कामयाब देखिए कब तक रहे
2. हुस्ने बे परवा को कुद बीन खुद आरा कर दिया

(10) फानी बदायूरी

1. खल्क कहती है जिसे दिल तेरे दिवाने का
2. दुनियां मैरा बला जाने मेंहगी है के सस्ती है

(11) जिगर मुरादाबादी

1. दिल गया रोकने हायत गई
2. सेरले खिदर ने दिल यह दिखाएं

(12) फराक गौरखपुरी

1. निगारे नाज दे पर्दे उठाए है क्या–क्या
2. बहुद पहले से उन कदमों की आहट जान लेते है

(13) मजरूम सुलतान पुरी

1. जला के मशअले जॉ हम जुन सिफात चले
2. मुझे सहल हो गई मंजिले

(14) ताल भोपाली

1. मैं हूं गदाए हुस्न न यूँ हॅस के टाल दे
2. है अजब भीड़ भाडत्र सड़कों पर

(15) जॉ निसार अख्तर

1. हम से भागा न करो दूर गजालो की तरह
2. न ख्वाब, खलिश न खुमार यह आदमी तो कोई सानेहा लगे है मुझे

(16) खलील उर्रेहमान आंजमी

1. हम जिन्दगी की साज पे गाते रहे नगमा तेरा
2. मै सूने मकान का दिया हूं

(17) फजला ताबिशं

1. एक दो धोखे हो तो यारो दिल रखने को खा भी लो
2. न कर शुमार के हर शै गिनी नहीं आती

इकाईयां : इकाई नं.

1. गजल से मुजाल्लिक सवालात 15 नम्बर
3. कदीम शुअरा पर तन्दीकी सवालात 15 नम्बर
4. जरीद गजल गो शुअरा पर सावालात 15 नम्बर
5. कदीम गजल गो शुअरा के अशआर की तशरीह 15 नम्बर
6. जदीद गजल गो शुअरा के अशआरकी तशरीह 15 नम्बर

B.A. PART-I

HOME SCIENCE PAPER – I

ANATOMY PHYSIOLOGY & HYGIENE

M.M.: 50

(Paper Code-0121)

NIT-1 Structure & functions of cell general introduction of Tissue and their functions skeletal system - Types of bones, classification general structure & functions of bones. Muscular system - General structure, types and function.

UNIT-2 Circulatory system - General structure of organs and functions, composition of blood & function. Respiratory system - General structure of organs and functions.

UNIT-3 Digestive system - General introduction of Nutrients, Liver and spleen organs of digestion their general structure and function. Excretory system - organs of excretion. Kidney & skin - structure & function.

UNIT-4 Nervous system - Central nervous system structure and function. Senses and Sensory organs - ear and eye structure & function.

UNIT-5 Hygiene - Personal Hygiene

Social Hygiene

Environmental and Industrial

Hygiene Water - its importance and

purification. Air - its importance and

purification.

First aid home nursing - Principles, qualities of nurse, Responsibilities, selection of sick room, care of the patient. Some common accidents and their aid, poison, bleeding, Burns and scalds, fracture sprain, dislocation.

13.06 13/6/19 13.06.19

HOME SCIENCE

Paper – II

HOME SCIENCE - EXTENSION EDUCATION

(Paper Code-0122)

UNIT-1 Introduction of Home Science Extension Education:

(A) Home Science - Concepts, goals and Areas of Home Science & their inter relationship with extension.

(B) Principles and methods of home science extension education general concepts of extension work.

(C) Objectives of extension education qualities of extension workers, extension education process.

UNfT-2 Community Development problems and Role of Home Scientists:

(A) Principles of community development organization and function of community development.

(B) Role of home scientists in community development, programmes of extension education for community, programmes of community development at central, state, district, block and village level.

Family plalnning programme.

Community problems, child marriage, Dowery system, parda pratha, rural indibtendness unemployment.

UNIT-3 Teaching methods & aids:

Methods of learning - Discussion, demonstration, observation and their application to home science teaching.

Extension Methods - their scope advantages and application.scope and use in Home Science teaching

Extension Methods - their scope advantages and application.

UNIT-4 Attitude towards Home Science:

Attitudes towards Home Science, Motivation towards Home Science. Application of Home Science towards improvement in family living. Job opportunities in Home Science National and International agencies and their

13.6.19 13.06.19

collaboration with Home Science, Official organization Home Science Association of India, W.H.O. FAG, CARE, ICAR, ICDS, ICSSR, ICMR, IRDR Adult education.

UNIT-5 **Curriculum Planning in Home Science**:

Basic concept of curriculum planning comporrents of curriculum planning imple. Mentation evoluation' and improvement required in the existing system of H.Sc. education policy and its relevance to H.Sc. Programme planning- concept, principles objectives and steps in programme planning.

REFERENCE:

1. Extension -education and community development by Dhama O. P.
2. Co-operative Extension Work by Kelsey, L.D. and rleame C. R.
3. Extension education, Shri Lakshmi press by Reddy A. A.
4. An Introduction to programme evaluation John Wiley. Fracklin, J.K. & Thrashe / J.H.

13/6 13.6.19 13.06.19

प्रायोगिक

कुल समय 3 धंटे　　कुल अंक–50

अंको का विभाजन

1.	स्पेशल	10
2.	प्राथमिक उपचार	10
3.	गृह परिचर्या	15
4.	शरीर रचना एवं स्वास्थ्य विज्ञान	15

स्पेशल :(परीक्षा के समय छात्राऐं प्रायोगिक नोट बुक एवं उपचार पेटी जमा करें ।)

प्रयोग कमांक –1 रिर्पोट : कालेज की कक्षाओं का प्रतिदिन की सफाई एवं वायुविजन संबंधित निरीक्षण।

प्रयोग कमांक – 2 स्वयं के परिवार में पीने के पानी के प्राप्ति के साधन, संग्रह के प्रकार एवं साधन पानी की शुद्ध एवं स्वच्छता के लिये प्रयुक्त विधि।

प्रयोग कमांक –3 रिर्पोट : स्वयं के परिवार एवं अन्य दो पड़ोसी परिचत्रवार के घर में अगस्त से दिसम्बर (अनुमानत : पांच महीने) के दौरान हुई बीमारियों के संबंध में जानकारी ।

1. रोग का नाम ।
2. प्राथमिक उपचार– जो दिया गया।
3. आहार (जो उपयोग में लाया गया)

प्रयोग कमांक – 4 प्राथमिक उपचार पेटी (आवश्यक सामान)

1. घाव धोने एवं बांधने का सामान।
2. दर्द कम करने की दवाईयां।
3. अपाचन– में प्रयुक्त दवाईयां।

प्राथमिक उपचार पेटी छात्राएं परीक्षा के समय अपना नाम एवं परिवार के सदस्यो की संख्या लिखकर प्रस्तुत करें।

प्रयोग कमांक – 5 रोगी के लिये उपचारात्मक व्यंजनो का अध्यापक द्वारा करके बताना।

1. सब्जियों का सूप।
2. दाल का सूप।
3. उबला अंडा।
4. फटे दूध का पानी (व्हे वाटर)
5. सब्जी एवं फलों का स्टू

इन व्यंजनो की विधि एवं उपयोगिता नोट बुक में अंकित की जावेगी।

प्रयोग कमांक – 6 प्राथमिक उपचार

1. विभिन्न प्रकार की पट्टियां (तिकोनी, गोल)
2. घाव की देखभाल।
3. कृत्रिम श्वसन।

13.6　13/6/19　13.06.19

प्रयोग कमांक – 7 गृह परिचर्चा

1. शरीर के तापमान का चार्ट
2. गरम एवं ठंडे पानी की थैली तैयार करना।
3. बिस्तर लगाना/चद्दर बदलना।

प्रयोग कमांक– 8 दृष्य श्रव्य यंत्र का बनाना।

महत्वपूर्ण निर्देश– प्रयोग कमांक 1, 2, 3 तथा 5 की रिपोर्ट छत्राओ द्वारा प्रायोगिक नोट बुक में लिखकर एवं अध्यापक द्वारा प्रति हस्ताक्षरित/प्रमाणित करवाकर परीक्षा के समय प्रस्तुत की जावेगी।

13/6/19 13.06.19

INSURANCE PRINCIPAL & PRACTICE (Paper Code-0139)

PAPER - I

LIFE INSURANCE : **M.M. : 50**

UNIT-1 Introduction :

Need for security against economic difficulties, Risk and uncertinty, Individual value system, Individual, Life Insurance Nature and uses of Life Insurance, Life Insurance as a collateral, as a measure of financing business continuation, as a protection to property, as a measure of investment.

UNIT-2 Life Insurance Contract :

Distinguishing characteristics, Utmost Good Faith, Insurable Interest, Caveat Emptor, Unilateral and alleatory nature of contract, proposal and application form, Warranties Medical examination, policy construction and delivery, policy provision, lapse revival, surrender value, paid-up policies, maturity, nomination and assignment. Suicide and payment of insured amount, Loan, to policy holders.

UNIT-3 Life Insurance Risk :

Factors governing sum assured, Methods of calculating economic risk in life insurance proposal. Measurement of risk and mortality table, Calculation of Premium, Treatment of sub-standard risks. Life Insurance Fund, valuation and investment of surplus, Payment of bonus.

UNIT-4 Life Insurance Policies :

Types and their applicability to different. Situations, Important life Insurance Policies issued by the life Insurance Corporation of India. Life Insurance annuities. Important legal provisions and judicial pronouncements in India.

UNIT-5 Salesmanship in Life Insurance :

Rules of agancy Essential qualities of an ideal insurance salesman, Rules to canvass business from prospective customers, After-sale service to policy holders.

GENERAL INSURANCE (Paper Code-0140)

PAPER - II **M.M. : 50**

UNIT-1 1. Introduction to risk and insurance.

(A) Risk (B) The treatment of Risk

2. The structure and operation of the insurance business.

UNIT-2 (a) Insurance contract fundamentals.

(b) Insurance marketing.

(c) Insurance loss payment.

(d) Underwriting, rating, reinsurance, and other functions.

UNIT-3 General Insurance corporation and other Insurance institutions.

Working of GIC in India; Types of risks assumed and specific policies issued by ECGC.

UNIT-4 Health Insurance :

(a) Individual health insurance.

(b) Group health insurance.

UNIT-5 (a) Motor Insurance.

(b) Multiple line and all lines Insurance such as rural Insu-rance - Hull Insurance-etc.

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FUNCTIONAL ENGLISH

(Paper Code-0137)

PAPER - I **M.M. : 50**

UNIT-1 (a) Linguastics and Phonetics.
(b) Phonology.

UNIT-2 (a) The Organs of Speech
(b) Speech Sounds - Vovels and Consonants

UNIT-3 Consonant Clusters in English

UNIT-4 Phonetic symbols

UNIT-5 Transcriptions

Based on a text of English Phonetics for Indian students by Balsybramanium.

FUNTIONAL ENGLISH

(Paper Code-0138)

PAPER - II **M.M. : 50**

UNIT-1 Articles, Parts of Speech, Linking Verbs Nagative sentences.

UNIT-2 Questions, Agreement of verb and subject, Transitive and Intrasitive regular and in-
regular verbs.

UNIT-3 Tenses

UNIT-4 Question Tags, Transformetin Active and Passive Voice, Direct and Indirects S

UNIt-5 Common Errors in English.

Based on F.T. words Grammer

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

VIVA - VOCE

SYALLABUS FOR THEORY AND PRACTICAL

(Drawing and painting) **M.M. 50**

B.A. (Drawing and painting) course is divided into three parts : B.A. 1st year, B.A. IInd year, B.A. III Year, all Examination is conducted by University for all class Maximum marks will be 150 the three parts details are as under :-

B.A. Ist Year

SESSION – 2019-20

THEORY FUNDAMENTAL OF PAINTING (ART)

The Time Of Theory Paper Is Three Hours **M.M. : 50**

1. Defination of Art
2. Classificaction of Art
3. Elements of painting - Line, Form, Colour, Tone, Texture, Space.
4. Shadang - Rupa Veda, Pramanani, Bhava, Labanya, Yojan, Sadrusya, Varnika Bhang.

BOOK RECOMMENDED :

1.	Still life Painting	-	Richmend.
2.	Akar Kalpna	-	Ranbir Saxana
3.	Chirta Sayanjan	-	P. N. Choyal
4.	Kala ke mull Tatya	-	Dr. C. L. Jha

14/06/19

PRACTICAL

There will be Two Practical Paper Evalution will be made by the external and the internal examiners. Together, and Sessional Marking is made by the class Teacher.

* The time of each paper is four hour's and there will be a half hour's recess in between.

STILL LIFE

(Paper Code-0150)
PAPER – I
SESSION – 2019-20

Scheme of Examination
Time - 4 Hours
Paper - 1/4 Imp Size
Meldium - Water Colour

Total Mark - 50
Exmination - 40
Sessional - 10

Class Work - Minimum work to be Submitted. Five Paining Size 1/4 IMP
Any type of still object will be dreown books, flower pot's Frouts etc.

BASIC DESING

(Paper Code-0150 A)
PAPER – II
SESSION – 2019-20

Scheme of Examination
Time - 4 Hours
Paper - 1/4 Imp Size
Meldium - Water Colour or Poster Colour

Total Mark - 50
Exmination - 40
Sessional - 10

Class Work - Minimum work to be Submitted. Five Paining Size 1/4 IMP
Form of netural element and object will be decoreted and repeated. Form like Flower, leaf, fruits, pot. Boll and Geometrial desing will be drown and painted with water colour and poster colour.

16/06/20

B.A. EDUCATION PART - I

PAPER - I

EDUCATION AND SOCIETY **M.M. 75**

(Paper Code-0123)

COURSE OBJECTIVES

To enable the students to understand -

1. The general aims of Education alongwith Nature types and Scope of educations.
2. Meaning of Major Philosophies of education and function of education.
3. Meaning of curriculum and its Planning and Construction.
4. The Importance of Play and activity oriented education and Modern Methods of Teaching.
5. Specific aims of education as per the present day needs.

UNIT-1 Nature and Scope of Education, Education as a Science, Education as a Social
Process, Factors of Education.

- Aims of Education-Individual, Social, Vocational and Democratic.
- Formal, informal and non formal agencies of education, Relation between School and Society.

UNIT-2

- School a Miniature Society.
- Education and State-To talitarian and Democratic concepts, State Control over Education, Nature.
- Centralization and Decentralization.

UNIT-3

- Curriculum definition, Types of Curricula. Principles of Curriculum Construction,
- Child Centred and Life Centred Curricula.
- Co-Curricular activities.
- Education and Craft, Principle of Basic Education.
- Freedom and Discipline, Need of discipline in and out of school, discipline and
- Order, Free disciplin

UNIT-4

.

- Value Education, MEaning of Human Values. Their development, Some Transactional Strategies.

UNIT-5 Education for National Integration, I nternational understanding and education
for Human resource development, Education for Licture.
Secularism and Education.

Shiksha Sidhant - Pathak and Tyagi - Vinod Pustak Mandir, Agra.

PAPER - II
PROBLEMS OF EDUCATION
(Paper Code-0124)

M.M. 75

UNIT-1 ● Problems and suggestions for improvement in Primary Educn.

- Problems and suggestions for improvement in Secondary Educn.

UNIT-2 ● Problems and Suggestions for improvement in Higher Educn.

- Problems and Suggestions for improvement in Teacher Educn.

UNIT-3 ● Problems and Suggestions for improvement in Women Educn.

- Problems and Suggestions for improvement in Adult Educn.

UNIT-4 ● Problems and Suggestions for improvement in Technical Education.

- Problems and Suggestions for improvement in Distance Education.

UNIT-5 ● Problems and Suggestions for improvement in Population Education.

- Problems and Suggestions for improvement in Environmental Education.

BOOK RECOMMENDED :

1. A. Mishra - The Financing of Indian Education.
2. Nurullah and Naik - A History of Education in India.
3. S. N. Mukherjee - Education in India Today and Tomorrow.
4. K.G. Saiyad - Problems of Education Reconstruction.
5. Mahatma Gandhi - Our Language Problems.
6. S.R. Dongerkerry - University and their Problems.
7. R.V. Parulacker - Literacy in India.
8. G. Ghaurasia - New Era in Teacher Education.
9. J.P. Naik - Education Planning in India.
10. J.C. Agrawal - Progress of Education in India.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 2960/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–दो के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

———00———

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–दो के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2020–21 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी.– आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) – आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।

उपरोक्त विषयों को शिक्षा सत्र 2020–21 से संशोधित रूप में स्नातक स्तर भाग–दो के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 में लागू पाठ्यकम मान्य होंगे एवं भाग – तीन के पाठ्यक्रम यथावत रहेंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय के परीक्षा विभाग एवं वेबसाईट पर प्रकाशित करने हेतु वेबसाईट प्रभारी को उपलब्ध करा दी गई है।

कुलसचिव

क्र. 2961/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 परिपेक्ष्य में सूचनार्थ।
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

REVISED ORDINANCE NO.11

(As per State U.G.C. Scheme)

BACHELOR OF ARTS

1. The three year course have been broken up into three Parts.

   Part-I Examination : at the end of the first year.
   Part-II Examination : at the end of the second year and
   Part-III Examination : at the end of the third year.

2. A candidate who after passing (10+2) or Intermediate Examination of C.G. Board of Secondary Education, Raipur or any other examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.A. Part-I examination.

3. A candidate who after passing B.A. Part-I examination of the University or any other examination recognised by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part II Examination.

4. A candidate who after passing B.A. Part II examination of the University has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate candidates shall be eligible for admission to the examination as per provisions of Ordinance N. 6 relating to Examinations (General). Provided that non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular students at any of the University Teaching Department or College.

6. Every candidate for the Bachelor of arts examination shall be examined in :

A. Foundation Course:

I - Group - Hindi Language

II - Group - English Language

B. Three Course subjects : One subject from any three groups out of the following six groups :

1. Sociology/Ancient Indian History Culture and Anthropology.
2. Political Science/Home Science / Drawing & Painting / Vocational Course.
3. Hindi Literature/Sanskrit Literature /Urdu Literature/Mathematics
4. Economics/Music/Defence studies / Linguistics.
5. Philosophy/Psychology/Geography/Education/Management.
6. History/English Literature/Statistics.
7. Practicals (if necessary) for each core subject.

7. Any candidate who has passed the B.A. examination of the University shall be allowed to present himself for examination in any of additional subjects prescribed for the B.A. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.A. Part I examination in the subject which he proposes to offer and then the B.A. Part II and Part III examination in the same subject. Successfull candidate will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total makrs in each subject/group of subjects. In subject/group of subjects, where both theory and practical examination are provided, an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part II and part-III examination. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the divison of the Final examination, total marks obtained by the examinees, in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part I Examination.

Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject only the total aggregate marks being carried over for determining the division shall include the actual marks obtained in the subject in which he appeared at the supplementary examination.

10. Successful exminees at the Part-III examination obtaining 60% or more marks shall be placed in the First division, those obtaining less than 60% but not less than 45% marks in the Second division and other successful examinees in the third division.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Min. Marks
	i) Environmental Studies		75	
	Fild Work		25	33
A.	Foundation Course			
	i) Hindi Language - I		75	26
	ii) English Language - II		75	26
B.	Three Core Subject :			
	1. Hindi Literature	I	75	50
		II	75	
	2. Sanskrit Literature	I	75	50
		II	75	
	3. English Literature	I	75	50
		II	75	
	4. Philosophy	I	75	50
		II	75	
	5. Economics	I	75	50
		II	75	
	6. Political Science	I	75	50
		II	75	
	7. History	I	75	50
		II	75	
	8. Ancient Indian History	I	75	
	Culture & Archaeology	**II**	75	50
	9. Sociology	I	75	50
		II	75	
	10. Geography	I	50	33
		II	50	
		Practical	50	17
	11. Mathematics	I	50	
		II	50	50
		III	50	
	12. Statistics	I	50	33
		II	50	
		Practical	50	17
	13. Anthropology	I	50	33
		II	50	
		Practical	50	17

14.	Linguistics	I	75	50
		II	75	
15.	Indian Music	I	50	33
		II	50	
		Practical	50	17
16.	Home Science	I	50	33
		II	50	
		Practical	50	17
17.	Education	I	75	50
		II	75	
18.	Psychology	I	50	33
		II	50	
		Practical	50	17
19.	Management	I	75	50
		II	75	
20.	Defence Studies	I	50	33
		II	50	
		Practical	50	17
21.	Urdu	I	75	50
		II	75	
22.	Dance	I	50	33
		II	50	
		Practical	50	17
23.	Vocational Course	I	50	33
		II	50	
		Practical	50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986-

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the university or examination centres.
3. Calculators with, memory and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

संशोधित पाठ्यक्रम
बी.ए./बी.एस–सी./बी.कॉम./बी.एच.एस.–सी.
भाग – दो, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा) (पेपर कोड – 0171) **पूर्णांक– 75**

खण्ड – क निम्नलिखित 5 लेखकों के पाठ शामिल होंगे – **अंक–35**

1. महात्मा गांधी	–	चोरी और प्रायश्चित
2. आचार्य नरेंद्र देव	–	युवकों का समाज में स्थान
3. वासुदेव शरण अग्रवाल	–	मातृभूमि
4. हरि ठाकुर	–	डॉ. खूबचंद बघेल
5. पं. माधवराव सप्रे	–	सम्भाषण–कुशलता

खण्ड–ख हिन्दी भाषा और उसके विविध रूप **अंक–16**

1. कार्यालयीन भाषा
2. मीडिया की भाषा
3. वित्त एवं वाणिज्य की भाषा
4. मशीनी भाषा

खण्ड–ग हिन्दी की व्याकरणिक कोटियॉ **अंक–24**

संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण,
समास, संधि एवं संक्षिप्तियां
अनुवाद व्यवहार : अंग्रेजी से हिन्दी में अनुवाद

इकाई विभाजन–

इकाई– 1 चोरी और प्रायश्चित : महात्मा गांधी / कार्यालयीन भाषा, मीडिया की भाषा

इकाई– 2 युवकों का समाज में स्थान : आचार्य नरेन्द्र देव / वित एवं वाणिज्य की भाषा, मशीनी भाषा

इकाई– 3 मातृभूमिः वासुदेवशरण अग्रवाल / संज्ञा सर्वनाम, विशेषण, क्रिया विशेषण

इकाई– 4 डॉ. खूबचंद बघेल : हरि ठाकुर/समास, संधि,

इकाई– 5 सम्भाषण–कुशलता : पं. माधवराव सप्रे, / अनुवाद – अंग्रेजी से हिन्दी में अनुवाद, संक्षिप्तियॉ

मूल्यांकन योजना –

प्रत्येक इकाई से एक–एक प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई को दो–दो खण्डों (क्रमश' 'क' और 'ख' में) विभक्त करते हुए निर्धारित पाठ से 8 एवं शेष पाठ्य सामग्री से 7 अंक के प्रश्न होंगे। इस प्रकार पूरे प्रश्न–पत्र के पूर्णांक 75 होंगे।

पाठ्यक्रम संशोधन का औचित्य : विद्यार्थी चर्चित एवं सुप्रसिद्ध व्यक्तियों के लेख के माध्यम से समाज एवं राष्ट्रहित के साथ–साथ व्यक्तित्व विकास विषयक मुद्दों से परिचित हो सके तथा व्याकरिणक एवं भाषा विषयक प्रस्तावित पाठ्यक्रम के माध्यम से हिन्दी भाषा संबंधित प्रयोग पक्ष से परिचित होते हुए प्रतियोगी परीक्षाओं की दृष्टि से ज्ञानार्जन कर सके।

ENGLISH LANGUAGE (Paper Code-1132)

B.A. / B.Sc. /B.COM. /B.H. Sc. - II

M.M.75

The question paper for B.A. /B.Sc./B.Com./B.H.Sc., English Language and cultural valuers shall comprise the following units:

UNIT-I Short answer questions to be passed by (Five short answer questions of three marks each) 15 Marks

UNIT-II (a) Reading comprehension of an unseen passage 05 Marks

(b) Vocabulary

UNIT-III Report-Writing 10 Marks

UNIT-IV Expansion of an idea 10 Marks

UNIT-V Grammar and Vocabulary based on the prescribed text book. 20+15Marks

Note: Question on all the units shall asked from the prescribed text which will Comprise Specimens of popular creative/writing and the following it any

a Matter & technology

i. State of matter and its structure

ii. Technology (Electronics Communication, Space Science)

b Our Scientists & Institutions

I. Life & work of our eminent scientist Arya Bhatt. Kaurd Charak Shusruta, Nagarjuna, J.C. Bose and C.V. Raman, S. Rmanujam, Homi J. Babha Birbal Sahani.

II. Indian Scientific Institutions (Ancient & Modern)

Books Prescribed:

Foundation English for U.G. Second Year - Published by M.P. Hindi Granth Academy, Bhopal.

संशोधित

बी. ए. भाग–2

हिन्दी साहित्य

प्रथम प्रश्न पत्र

अर्वाचीन हिन्दी काव्य (पेपर कोड– 0173) पूर्णांक– 75

प्रस्तावना– आधुनिक काव्य आधुनिकता की समस्त विशेषताओं को समेटे हुए है। स्वतंत्रता प्राप्ति के पूर्व की भाव– भाषा, शिल्प, अन्तर्वस्तु सम्बन्धी समस्त विकास धारा यहां सजीव रूप में देखी जा सकती है। इसे अनदेखा करना मनुष्य की विकास यात्रा को नजर अंदाज करना है। इस यात्रा के साक्षात्कार के लिए आधुनिक काव्य का अध्ययन अपेक्षित ही नहीं अपितु अनिवार्य हैं।

पाठ्य विषय–

1. मैथिलीशरण गुप्त – भारत– भारती की कविताएँ
2. सूर्यकान्त त्रिपाठी निराला –
   (1) सखि बसन्त आया।
   (2) वर दे, वीणा वादिनी वर दे।
   (3) हिन्दी के सुमनों के प्रति पत्र।
   (4) तोड़ती– पत्थर।
   (5) राजे ने अपनी रखवाली की।
3. सुमित्रानंदन पंत –
   (1) बादल।
   (2) परिवर्तन 2 पद (1.खोलता इधर जन्मलोचन
   2. आज का दुख कल का आल्हाद)
   (3) ताज।
   (4) झंझा में नीम।
   (5) भारत माता।
4. माखन लाल चतुर्वेदी –
   (1) बलि पंथी से ।
   (2) साँझ और ढोलक की थापें।
   (3) मैं बेच रही हूँ, दही।
   (4) उलाहना।
   (5) निः शस्त्र सेनानी।
5. स. ही. वात्स्यायन अज्ञेय –
   (1) सबेरे उठा तो धूप खिली थी।
   (2) साम्राज्ञी का नैवेद्य दान।
   (3) घर।
   (4) चांदनी जी लो।
   (5) दूर्वांचल।

द्रुतपाठ हेतु निम्न कवियों का अध्ययन किया जाएगा, जिन पर लघुउत्तरीय प्रश्न पूछे जायेंगे–

11/02/2019

संशोधित

बी. ए. भाग–2

हिन्दी साहित्य

द्वितीय प्रश्न पत्र

हिन्दी निबंध तथा अन्य गद्य विधाएँ(पेपर कोड– 0174) पूर्णांक– 75

पाठ्य विषय–

व्याख्या एवं आलोचनात्मक प्रश्नों के लिए एक नाटक, पांच प्रतिनिधि निबंध और पाँच एकांकी का निर्धारण किया गया है।

नाटक– अंधेरी नगरी– भारतेन्दु हरिश्चन्द्र

निबंध– 1. कोध – आचार्य रामचन्द्र शुक्ल।
2. बसन्त – डॉ. हजारी प्रसाद द्विवेदी।
3. उस अमराई ने राम– राम कही है – डॉ. विद्यानिवास मिश्र।
4. काव्येषु नाट्यम रम्यम् – बाबू गुलाब राय।
5. बेईमानी की परत – हरिशंकर परसाई

एकांकी– 1. औरंगजेब की आखिरी रात – डॉ. रामकुमार वर्मा
2. स्ट्राईक – भुनेश्वर
3. एक दिन – लक्ष्मीनारायण मिश्र
4. दस हजार – उदयशंकर भट्ट
5. मम्मी ठकुराईन – डॉ. लक्ष्मीनारायण लाल

द्रुत पाठ के लिए तीन गद्यकारों का अध्ययन किया जायेगा, जिन पर लघुउत्तरीय प्रश्न पूछे जायेंगे।
1. राहुल सांकृत्यायन 2. महादेवी वर्मा 3. हबीब तनवीर

अंक विभाजन– व्याख्याएं (3)	– 21 अंक
आलोचनात्मक प्रश्न (2)	– 24 अंक
लघुउत्तरीय प्रश्न (5)	– 15 अंक
वस्तुनिष्ठ (15)	– 15 अंक
कुल अंक	75 अंक

इकाई विभाजन–
इकाई– 1 व्याख्या
इकाई– 2 अंधेरी नगरी एवं कोध, वसन्त, उस अमराई ने राम– राम कही हैं।
इकाई– 3 औरंगजेब की आखिरी रात, स्ट्राईक, एक दिन, दस हजार, मम्मी ठकुराईन
इकाई– 4 द्रुतपाठ के गद्यकार– राहुल सांकृत्यायन, महादेवी वर्मा, हबीब तनवीर।
इकाई– 5 वस्तुनिष्ठ (समग्र पाठ्य विषय से)

ENGLISH LITERATURE

PAPER-I

MODERN ENGLISH LITERATURES (Paper Code-0175)

M.M. 75

All Questions are compulsory.

Note : 1. Unit-I is compulsory. Two passages from each of the units I to V to be set and three to be attempted. (3 x 5 = 15)

2. Short answer questions from unit VII, seven to be set and five to be attempted. (5 x 2 = 10)

3. Long answer questions from unit II to VI. Five questions from each unit with internal choice to be set. (5 x 2 = 10)
(Words limit for each answer is 300-400 words)

UNIT-I Annotations

UNIT-II (Poetry)
W.B. Yeats - 'A Prayer for My Daughter, The Second Coming
T.S. Eliot - 'Love Song of J. Alfred Prufrock'

UNIT-III (Poetry)
Dylan Thomas - 'Lament, 'A Refusal to Mourn the Death
Larkin - 'Toads', At Grass'

UNIT-IV (Prose)
Bertrand Russell - On the Value of Scepticism
Oscar Wilde - Happy Prince

UNIT-V (Drama)
G.B. Shaw - Pygmalion

UNIT-VI (Fiction and short-stories)
Rudyard Kipling-Kim
Short-Stories
Katherine mansfield - A Cup of Tea

UNIT-VII
1. Elegy,
2. Sonnet,
3. Ode,
4. Morality & Miracle Play,
5. One Act Play,
6. Interlude

BOOKS RECOMMENDED :

1. An Introduction to the study of English Lit. B. prasad
2. A Glossart of Literary Terms - M.H. Abrahamas
3. Prose of Today - M. Millan Pub
4. Short stories of Yesterday and To day - M. Millan

Dr. M. Chakraborty DR. S Gupta DR. MERILY ROY

PAPER - II

MODERN ENGLISH LITERATURS (Paper Code-0176)

M.M. 75

All question are complusory.

Note : 1. Unit I is complusory. Two passages from each of the units II to V to be set and three to be attempted. (3x5 = 15)

2. Short answer questions from unit VII, seven to be set and five to be attempted. (5x2 = 10)

3. Long-answer questions from unit II to VI. Five questions from each unit with internal choice to be set. (5x2 = 10)
(Words limit for each answer is 300-400 words)

UNIT-I Annotation

UNIT-II **(Poetry)**
Sasson - At the Grove of Henry Vaughan.
Owen, W.H. - Strange Meeting

UNIT-III **(Poetry)**
Auden - Seascape
Ted Hughes - The Howling of Wolves

UINT-IV **(Prose)**
Robert Lynd - Forgetting
H. Belloc - A conversation with A Reader

UNIT-V **(Drama)**
John Galsworthy - Strife

O R J.M. Synge - Riders of the Sea

UNIT-VI William Golding - Lord of the Flies (Fiction)

UNIT-VII 1. Simile 2. Metaphor 3. Alliteration 4. Onomaetopoea 5. Ballad 6. Epic 7. Dramatic Monologuc.

BOOK RECOMMENDED -

1. Golden Treasury - Palgrave
2. A Glossary of Literary Terms - M.H. Abrams
3. An Introduction to the study of English literature - B.Prasad

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Dr. M. Chakraborty DR. MERILY ROY

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम

दर्शन शास्त्र

बी.ए. भाग–दो, दर्शन शास्त्र में दो प्रश्न पत्र (75 अंक) के होंगे

1. नीति शास्त्र – भारतीय एवं पाश्चात्य
2. धर्म दर्शन

प्रत्येक प्रश्न पत्र पांच इकाईयों में विभाजित है । प्रत्येक इकाई में से एक प्रश्न हल करना अनिवार्य होगा ।

बी.ए. भाग – दो
दर्शन शास्त्र
प्रश्न पत्र – प्रथम
नीतिशास्त्र –भारतीय एवं पाश्चात्य (कुल 75 अंक)

इकाई–1
1. नीतिशास्त्र : परिभाषा, स्वरूप एवं उपयोगिता
2. मूल्य : नैतिक मूल्य एवं अन्य मूल्यों में अंतर
3. कर्म का सिद्धांत

इकाई–2
1. पुरूषार्थ : पुरूषार्थों का आपस में सम्बन्ध, पुरूषार्थ– साधना
2. बौद्ध नीति : चार आर्य सत्य
3. जैन नीति : अणुव्रत एवं महाव्रत

इकाई–3
1. संकल्प की स्वतंत्रता एवं उत्तरदायित्व
2. दण्ड का सिद्धांत
3. सद्गुण : सुकरात , प्लेटो एवं अरस्तू के अनुसार

इकाई –4
1. सुखवाद : बेंथम एवं मिल
2. चार्वाक का सुखवाद
3. कांट : कर्तव्य के लिए कर्तव्य

इकाई –5
1. अंतः प्रज्ञावाद
2. पूर्णतावाद
3. गीता का निष्काम कर्मयोग

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम

बी.ए. भाग – दो

दर्शन शास्त्र

प्रश्न पत्र द्वितीय – धर्म दर्शन

(कुल अंक –75)

इकाई–1 1. धर्म : धर्म एवं रिलिजन में अंतर

2. धर्म–दर्शन : अर्थ, स्वरूप

3. धर्म एवं धर्म–दर्शन में अंतर

4. धर्म की उत्पत्ति के सिद्धांत

इकाई–2 1. धार्मिक अनुभव : ब्रह्मानुभव एवं रहस्यवाद

2. बुद्धि, विश्वास एवं अंतः प्रज्ञा

3. धार्मिक विश्वास एवं अन्य विश्वास

इकाई–3 1. ईश्वर : ईश्वर के गुण

2. ईश्वर के अस्तित्व के प्रमाण : भारतीय एवं पाश्चात्य

3. प्रार्थना एवं भक्ति

इकाई–4 1 अनीश्वरवाद

2. ईश्वर के बिना धर्म

3. धर्म– निरपेक्षता

इकाई–5 1 आत्मा की अमरता

2. पुनर्जन्म एवं कर्म का सिद्धांत

3. अशुभ की समस्या

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

बी. ए. भाग 2 B. A. Part II

राजनीति विज्ञान Political Science

प्रथम प्रश्नपत्र : राजनीतिक चिन्तन Paper I : Political Thought

इकाई 1 : प्लेटो : आदर्श राज्य – न्याय, शिक्षा, साम्यवाद, दार्शनिक शासक ।

अरस्तू : राज्य, दासप्रथा, नागरिकता , क्रान्ति ।

Unit 1 : Plato : Ideal State : Justice, Education, Communism , Philosopher King.

Aristotle : State, Slavery, Citizenship , Revolution.

इकाई 2 : मैकियावेली : युग का शिशु, धर्म व नैतिकता, राजा के कर्तव्य और आचरण।

हॉब्स : सामाजिक समझौता सिद्धान्त – लेवियाथन । लॉक : सामाजिक समझौता सिद्धान्त ।

रुसो : सामाजिक समझौता सिद्धान्त , सामान्य इच्छा ।

Unit 2 : Machiavelli : Child of his times, Religion and Morality, Duties and Conduct of King. Hobbes : Social Contract Theory: Leviathan. Locke : Social Contract Theory. Rousseau : Social Contract Theory and General Will.

इकाई 3 : बेंथम : उपयोगितावाद । मिल : उपयोगितावाद में संशोधन, स्वतंत्रता और प्रतिनिधि शासन ।

ग्रीन : राजनीतिक विचार । मार्क्स : राजनीतिक विचार ।

Unit 4 : Bentham : Utiliterianism. Mill : Amendment in Utiliterianism. Liberty and Representative Government. Green : Political Thoughts. Marx : Political Thoughts.

इकाई 4 : आदर्शवाद, व्यक्तिवाद, उदारवाद, समाजवाद, फासीवाद : विशेषताएं और आलोचना ।

Unit 4 : Idealism, Individualism, Liberalism, Socialism, Fascism : Features and Criticism.

इकाई 5 : मनु और कौटिल्य : सप्तांग सिद्धान्त, राजा और राजपद, प्रशासकीय व्यवस्था, राज्यमण्डल ।

गांधी : सत्य, अहिंसा, सत्याग्रह एवं राजनीतिक विचार । अम्बेडकर : राजनीतिक एवं सामाजिक विचार

दीनदयाल उपाध्याय : एकात्ममानववाद ।

Unit 5 : Manu and Kautilya : Saptang Theory, King and Kingship, Administrative System, Rajyamandal.

Gandhi : Truth , Non violence , Satyagrah and Political thoughts.

Ambedkar : Political and Social thoughts.

Deen Dayal Upadhyay : Akatmamanavvad.

बी.ए.– द्वितीय वर्ष
प्रथम प्रश्न पत्र – राजनीतिक चिन्तन

संदर्भ पुस्तक

क्र	पुस्तक का नाम	लेखक का नाम
1.	राजनीतिक चिन्तन की रूपरेखा	ओ.पी. गावा
2.	राजनीतिक चिन्तन का इतिहास	जीवन मेहता
3.	राजनीतिक चिन्तन का इतिहास	बी.एल. फाडिया
4.	पाश्चात्य एवं आधुनिक राजनीतिक चिन्तन का इतिहास	प्रभू दत्त शर्मा
5.	पाश्चात्य राजनीतिक चिन्तन	जे.पी. सूद
6.	भारतीय राजनीतिक चिन्तन	वी.पी. वर्मा
7.	भारतीय राजनीतिक चिन्तन	अवस्थी एवं अवस्थी
8.	भारतीय राजनीतिक चिन्तन	ओ.पी. गावा
9.	पोलीटिकल थाट	सी.एल. बपर
10.	हिस्ट्री आफ पोलीटिकल थियरी	जार्ज एच सबाइन
11.	रिसन्ट पोलीटिकल थाट	फ्रान्सीस डब्लू कोकर
12.	मास्टर आफ पोलीटिकल थाट	माइकल बी. फास्टर
13.	ग्रट पोलीटिकल थाट	विटयम इवस्टान

Reference:-

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- Brian R. Nelson, **Western Political Thought**, Delhi NCR: Pearson Education Ltd., 1996

बी. ए. भाग 2 B. A. Part II

राजनीति विज्ञान Political Science

द्वितीय प्रश्नपत्र : तुलनात्मक शासन एवं राजनीति

Paper II : Comparative Government and Politics

इकाई 1 : ब्रिटिश संविधान : विकास, विशेषताएं, कार्यपालिका , व्यवस्थापिका, न्यायपालिका ।

Unit 1 : British Constitution : Evolution , Salient Features, Executive, Legislature and Judiciary.

इकाई 2 : संयुक्त राज्य अमेरिका का संविधान : विशेषताएं, कार्यपालिका , व्यवस्थापिका, न्यायपालिका , शक्ति पृथक्करण व नियंत्रण संतुलन का सिद्धान्त ।

Unit 2 : Constitution of United States of America : Salient Features, Executive, Legislature and Judiciary. Theory of Separation of Powers and checks and balances.

इकाई 3 : स्विटजरलैण्ड का संविधान : विशेषताएं, कार्यपालिका , व्यवस्थापिका, न्यायपालिका , प्रत्यक्ष प्रजातन्त्र। Unit 3 : Constitution of Switzerland : Salient Features, Executive, Legislature and Judiciary. Direct Democracy.

इकाई 4 : चीन का संविधान :विशेषताएं, कार्यपालिका , व्यवस्थापिका, न्यायपालिका, साम्यवादी दल ।

Unit 4 : Constitution of China : Salient Features, Executive, Legislature and Judiciary. Communist Party.

इकाई 5 : तुलनात्मक राजनीति : अर्थ, परिभाषा, । ईस्टन का व्यवस्था सिद्धान्त, आमण्ड का संरचनात्मक–प्रकार्यात्मक उपागम । राजनीतिक विकास, राजनीतिक समाजीकरण, राजनीतिक संस्कृति की अवधारणा।

Unit 5 : Comparative Politics : meaning , Definition. System Theory of David Easton, Structural -functional Approach of Almond. Concept of Political Development, Political Socialisation, Political Culture

बी.ए. द्वितीय वर्ष
द्वितीय प्रश्न पत्र
तुलनात्मक शासन एवं राजनीति

संदर्भ पुस्तक

क्र	पुस्तक का नाम	लेखक का नाम
1.	तुलनात्मक राजनीति एवं राजनीतिक संस्थाएं	सी बी गेना
2.	तुलनात्मक राजनीति	जे.सी. जौहरी
3.	तुलनात्मक राजनीति	पी.डी शर्मा
4.	तुलनात्मक राजनीति	एस.आर. महेष्वरी
5.	तुलनात्मक राजनीति संस्थाएं और प्रक्रियांए	तपन बिस्वाल
6.	कम्परेटीव गर्वनेमेंट	एस.ई. फाईनर

Reference :-

- Anup Chand Kapur, K.K. Mishra **Select Constitutions** (U.K., U.S.A., France, Canada, Switzerland, Japan, China, India), S. Chand & Company Ltd., New Delhi, 2001.
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- Shashi Kant Jha & Bhaswati Sarkar (eds.) **Amidst Turbulence & Hope, Transition Russia and Eastern Europe,** New Delhi, 2002
- Thomas F. Remington, **The Russian Parliament: Institutional Evolution in a Transitional Regime,** 1989-1999, Yale University Press, 2002
- Gabrial A. Almond and G. Bingham Powell (eds.) **Comparative Politics Today: A World view,** Harper Collins Publishers, 2002
- **The Russian Constitution,** Text as adopted in 1993
- J. C. Johri**, 'New Comparative Government'**, Lotus Press Publisher, 2008.
- Vidya Bhushan and Vishnu Bhagwan, **World Constitutions,** New Delhi

Revised syllabus

SOCIOLOGY 2019 - 2020

B.A. PART-II
PAPER – I
SOCIOLOGY OF TRIBAL SOCIETY
(Paper Code-0185)

UNIT-I **Tribes:** Concepts, Characteristics, Tribes and Schedule Tribes, Distinction between Tribe and Caste.

UNIT-II **Classification of Tribal people**: Food gatherers and hunters, Shifting cultivates, Nomads, Peasant settled Agriculturists and Artisans.

UNIT-III **Socio-cultural Profile**: Kinship, Marriage, Family, Religion and belief cultural traditions.

UNIT-IV **Tribal sensitization:** Tribal Mobility, Schemes of Tribal Development ,Various Tribal Movements.

UNIT-V **Problems of Tribal People**: Poverty, Illiteracy, Indebtedness, Agrarian issues, Exploitation study of tribal communities in Chhattisgarh with special reform to Particularly Venerable Tribal Groups (PVTG).

ESSENTIAL READINGS :-

1 Vidyarthi, L.P. 1965. Cultural Counters of Tribal Bihar, Punthi Pustak, Culcutta.
2 Bose, N.K. 1971. Tribal Life in India, National Book Trust, New Delhi.
3 Das, R.K. 1988. The Tribal Social Structure, Inter India Publications, New Delhi.
4 Dubey, S.C.. 1977. Tribal Heritage of India, Ethnicity, Identity and Interaction, Vol.1, Vikash Publishing House, Delhi.
5 Elwin, Varrier. 1989. The Tribal World of Verrier Elwin: An Autobiography, Oxford, New Delhi.
6 Russell, R.V. and Hira Lal. 1916. The Tribes and Castes of Central Province of India, 4 Vols. Cosmo Publications, New Delhi.

Shobhath 10/6/2019 10.06.2019 10-6-19

Revised syllabus

SOCIOLOGY 2019 - 2020

B.A. PART-II.

PAPER-II

CRIME AND SOCIETY

(Paper Code-0186)

UNIT-I **Concept of Crime**: Meaning, Characteristics and Types.

School of Crime: Classical, Sociological and Psychological.

UNIT-II **Structure of Crime**: Anomie, Criminality and Suicide , Organized Crime , White Collar Crime and Cyber Crime

UNIT-III **Social Evils and Crime:** Alcoholism, Drug Addiction, Dowry and Beggary.

UNIT-IV **Punishment**: Meaning, Characteristics, Objectives and Types, Major Theories of Punishment.

UNIT-V **Correctional Process**: Role of Police and Judiciary in India, Development of Jail reforms in India and Modern correctional concepts- Probation , Parole and after care Programe.

ESSENTIAL READINGS :-

1. Mike, & Maguire. (2007). *The Oxford Hand Book of Criminology.* London: Oxford University Press.
2. Haster, S., & Eglin, P. (1992). *A Sociology of Crime.* London: Routledge Publishers.
3. Mead, G. H. (1934). *Mind Self and Society.* Chicago: Chicago University Press
4. Gottfredson, Michael, R., Hirschi, & Travis. (1990). *A General Theory of Crime.* London: Stanford University Press.
5. Sutherland, & Edwin, H. (1924). *Principles of Criminology.* Chicago: Chicago University Press.
6. Sutherland, Edward, H., & White, C. (1949). *Crime.* New York, Holt, Rinehart: Winston Press, New York.

Shobhash 10/6/2019

10.06.2019

10-6-19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS

B.A. Part- II (Economics)

Subject : Macro Economics, Paper-I (Code: 0181)

UNIT 1

National Income: Concept and measurement of national income, Economic welfare and national income, Social accounting. Circular flow of income, National income accounting, Green accounting Classical theory of employment, Say's law of market Keynesean theory of employment.

UNIT 2

Consumption Function - Average and marginal propensity to consume, Keynes's psychological law of consumption. Determinants of the consumption function. The saving function. The investments multiplier and its effectiveness, The investment Function - marginal efficiency of capital, Autonomous and induced investment. Saving and investment equality.

UNIT 3

Nature and Characteristics of trade cycle, Theories of trade cycle: Hawtrey's monetary theory, Hayek's over investment theory, Keynes's view on trade cycles, Schumpeter's theory of innovation, Samuelson and Hicks multiplier accelerator model, Control of trade cycle.

UNIT 4

International Trade - Inter-regional and international trade, Comparative advantage cost theory, Opportunity cost theory and Heckscher Ohlin theory, International trade and economic development, Tariffs & import quotas, Concept of optimum tariff. Balance of trade & balance of payment., Concept & components of BOP, Equilibrium & disequilibrium in BOP, Relative merits & demerits of devaluation, Foreign trade multiplier.

UNIT 5

Functions and objectives of international monetary fund, World Bank and World Trade Organization, International monetary reforms and India, Foreign trade in

India recent change in the composition and direction of foreign trade, India's balance of payment, Export promotion and import substitution in India. Multinational Corporation and India.

BASIC READING LIST -

- Ackley, G. (1976) – " Macro Economics; Theory and Policy," Mcmillan Publishing Company, Newyork.
- Day, A.C.L. (1960) – "Outline of Monetary Economics," Oxford University Press Oxford.
- Gupta, S.B. (1994)- "Monetary Economics," S. Chand and Co., Delhi
- Heijdra, B.J. and F.V. Ploeg (2001) – "Foundations of Modern Macro-economics," Oxford University Press, Oxford.
- Lewis, M.K. and P.D. Mizan (2000) –" Monetary Economics, " Oxford University Press, New Delhi.
- Shapiro, E. (1996) – "Macroeconomic Analysis," Galgotia Publications, New Delhi .

READING LIST - - Ackley, G. (1976)," Macroeconomics : Theory and Policy", Macmillan Publishing Company, New York. -

Day, A.C.L. (1960) –" Outline of Monetary Economics," Oxford University Press Oxford.
- Gupta, S.B. (1994)- "Monetary Economics," S. Chand and Co., Delhi
- Heijdra, B.J. and F.V. Ploeg (2001) –" Foundations of Modern Macro-economics, " Oxford University Press, Oxford.
- Lewis, M.K. and P.D. Mizan (2000) - Monetary Economics, Oxford University Press, New Delhi.
- Shapiro, E. (1996) – "Macroeconomic Analysis," Galgotia Publications, New Delhi.
- Dillard, D. (1960)- "The Economics of John Mayanand Keynes, "Crossby Lockwood and Sons, London.
- Hanson, A.H. (1953), "A Guide to Keynes, " McGraw Hill, New York.
- Higgins, B. (1963), "Economic Development; Principles, Problems and Policies, " Central Book Depot, Allahbad.
- Keynes, J.M. (1936), "The General Theory of Employment, Interest and Money," Macmillan, London.
- Kindleberger, C.P. (1958), "Economic Development," McGraw Hill Book company, New York.
Powelson, J.P.C. (1960), " National Income and Flow of Funds Analysis," McGraw Hill, New York.

26/6/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS

B.A. Part- II (Economics)

Subject : Money, Banking and Public Finance, Paper-II (Code: 0182)

UNIT 1

Basic concepts : Money - meaning and functions, Gresham's law; Quantity theory of money- Cash transaction and cash balance approaches; Value of Money, Inflation, deflation and reflation, types, causes and effects on different sectors of the economy; Demand pull and cost push inflation; Measures to control inflation. Phillips curve, Concept of demonetization.

UNIT 2

Commercial banking- meaning and types; Functions of commercial banks, The process of credit creation, purpose and limitations; Liabilities and assets of banks; Evolution of commercial banking in India after independence; A critical appraisal of the progress of commercial banking after Nationalization, Functions of a central bank; Quantitative and qualitative methods of credit control; Bank rate policy; Open market operations; Variable reserve ratio and selective methods. Role and functions of the Reserve bank of India; Objectives and limitations of monetary policy with special reference to India.

UNIT 3

Meaning and scope of public finance; Distinction between private and public finance; public goods v/s private goods; The Principle of maximum social advantage; Role of the government in economic activities ; Public expenditure - Meaning, classification and principles of public expenditure; Trends in public expenditure and causes of growth of public expenditure in India.

UNIT 4

Sources of Public revenue; taxation - Meaning, Canons and classification of taxes; Division of tax burden. The benefit and ability to pay approaches; Impact and incidence of taxes; Taxable capacity; Effects of taxation; Characteristics of a good tax

system; Equity and Justice in Taxation, Major trends in tax revenue of the Central and State Government in India.

UNIT 5

Public debt and financial administration: Sources of public borrowing, Effects of public debt. Methods of debt redemption. The public budget- Kinds of budget, Economic and functional classification of the budget; Preparation and passing of budget in India.

READING LIST -

- Ackley G. (1978), "Macroeconomics : Theory and Policy," Macmillan Publishing Co., New York.
- Bhargavas B.H. (1981), "The Theory and Working of Union Finance in India," Chaitanya Publishing House Allaybad.
- Gupta, S.B. (1994)," Monetary Economics", S. Chand & Company, New Delhi.
- Houghton. E.W. (Ed.) (1988), "Public Finance." Pengum, Battinore - Jha R. (1998), Modorn Public Economics. Routledge, London.
- Mithani, D.M. (1981), "Modern Public Finance," Himalaya Publishing House, Mumbai.
- Musgrave, R.A. and P.B. Musgrave (1976)," Public Finance in Theory and Practice", McGraw Hill, Kogakusha, Tokyo.
- Shapiro, E. (1996), "Macroeconomics Analysis," Galgotia Publications, New Delhi.

ADDITIONAL READING LIST

- Day, A.C.L. (1960), "Outline of Monetary Economics, " Oxford University Press, Oxford.
- De Kock, M.H. (1960)," Central Banking." Staples Press, London.
- Due, J.E. (1963), "Government Finance," Irwin, Homewood.
- Government of India, "Economic Survey" (Annual), New Delhi
- Halm, G.N. (1955), "Monetary Theory," Asia Publishing House, New Delhi

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. द्वितीय वर्ष

इतिहास

प्रश्न पत्र – प्रथम

प्रश्न पत्र का नाम – भारत का इतिहास 1206 ई. से 1761 ई. तक

इकाई–1

1. सल्तनतकालीन एवं मुगलकालीन इतिहास के स्त्रोत
2. दास वंश– ऐबक, इल्तुतमिश, बलबन
3. खिलजी वंश– अलाउद्दीन खिलजी–सैनिक उपलब्धियां, राजस्व व्यवस्था एवं बाजार नियंत्रण
4. तुगलक वंश– मोहम्मद बिन तुगलक,

इकाई–2

1. मुगल साम्राज्य की स्थापना – बाबर एवं हुमायूँ
2. शेरशाह सूरी का प्रशासन
3. अकबर की राजपूत नीति
4. मुगल शासकों की धार्मिक नीति – अकबर से औरंगजेब तक

इकाई–3

1. मुगल प्रशासन
2. मध्यकालीन सामाजिक एवं आर्थिक दशा
3. भक्ति आंदोलन
4. सूफीवाद

इकाई–4

1. मध्यकालीन साहित्य, कला एवं स्थापत्य
2. विजयनगर राज्य
3. बहमनी राज्य
4. शिवाजी का प्रशासन

इकाई–5

1. पेशवा– बालाजी विश्वनाथ, बालाजी बाजीराव
2. पानीपत का तृतीय युद्ध– कारण एवं परिणाम
3. मराठों के अधीन छत्तीसगढ़ – बिम्बाजी भोसले
4. छत्तीसगढ़ में मराठा प्रशासन

संदर्भ ग्रन्थ सूचीः–

1. श्रीवास्तव ए.एल — भारत का इतिहास (अग्रेजी अनुवाद)
2. श्रीवास्तव ए.एल — दिल्ली सल्तनत (अग्रेजी अनुवाद)
3. श्रीवास्तव ए.एल — मुगलकालीन भारत (अग्रेजी अनुवाद)
4. हबीबुल्लाह — भारत में मुस्लिम शासन की बुनियाद
5. मजूमदार, राय चौधरी एवं दत्त — भारत का वृहत् इतिहास खंड–2
6. पंजाबी बी. के. — भारत का इतिहास (1206–1761)
7. हबीब एवं निजामी — दिल्ली सल्तनत
8. वर्मा हरिशचंद — मध्यकालीन भारत (750–1540)
9. शर्मा कालूराम एवं व्यास प्रकाश — मध्यकालीन भारतीय संस्कृति
10. सक्सेना आर.के. — दिल्ली सल्तनत
11. राधेशरण — भारत की सामाजिक एवं आर्थिक संरचना और संस्कृति के मूल तत्व (आदिकाल से 1950 ईस्वी तक)
12. पाण्डेय ए.बी. — पूर्व मध्यकालीन भारत
13. पांडेय ए.बी. — उत्तर मध्यकालीन
14. ईश्वरी प्रसाद — मुगलकालीन भारत
15. श्रीवास्तव एच.एस. — मुगलकालीन शासन व्यवस्था
16. सरदेसाई जी.एस. — मराठों का नवीन इतिहास खंड–2
17. सरकार जे.एन. — शिवाजी और उनका युग
18. त्रिपाठी आर.पी. — मुगल साम्राज्य का इतिहास और पतन
19. मित्तल ए.के. — यूनिफाइड इतिहास (प्रारंभ से 1761 ई.)
20. मित्तल ए.के — यूनिफाइड इतिहास प्राचीन काल से 1950 ईस्वी तक
21. Dey, U.N. — Mughal Government
23. Habib & Nizami — Comprehensive History of India
24. Majumdar, R. C. & Dutt — An Advanced History of India Vol-II
25. Mehta — Advanced Study in the Medival History of India
26. Pandey A.B. — Early Medieval India
27. Pandey A.B — Medieval India
28. Prasad Ishwari — Medieval India
29. Sarkar, J.N. — Shivaji and his Time
30. Satish Chandra — Madhyakalin Bharat
31. Niraj Shrivastav — Madhyakalin Bharat Prashasan,Samaj ,Sanskriti
32. पी.एल. मिश्र — मराठाकालीन छत्तीसगढ़
33. भगवान सिंह वर्मा — छत्तीसगढ़ का इतिहास

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. द्वितीय वर्ष

इतिहास

प्रश्न पत्र – द्वितीय

विश्व का इतिहास 1890 ई. से 1964 ई. तक

इकाई–1

1. विलियम द्वितीय की विश्व राजनीति
2. अफ्रीका का विभाजन
3. जापान का आधुनिकीकरण– मेईजी पुनर्स्थापना एवं जापान का आधुनिकीकरण

इकाई–2

4. रूस–जापान युद्ध : कारण एवं परिणाम
5. चीन अफीम युद्ध एवं चीन की क्रांति, साम्यवाद
6. पूर्वी समस्या –बर्लिन कांग्रेस, युवा तुर्क आंदोलन
7. बाल्कन युद्ध : कारण एवं परिणाम

इकाई–3

1. प्रथम विश्व युद्ध : कारण एवं परिणाम
2. वर्साय की संधि
3. रूस की क्रांति 1917 ई.
4. फासीवाद – मुसोलिनी

इकाई–4

1. नाजीवाद –हिटलर
2. जापान का सैन्यवाद
3. राष्ट्रसंघ : स्थापना एवं विल्सन के 14 सूत्र
4. द्वितीय विश्वयुद्ध : कारण एवं परिणाम

इकाई–5

1. संयुक्त राष्ट्र संघ – स्थापना एवं संगठन, उपलब्धियां
2. शीत युद्ध
3. गुट निरपेक्ष आंदोलन एवं पंचशील सिद्धान्त
4. विश्व शांति की चुनौती– कोरिया एवं फिलीस्तीन समस्या
5. एक ध्रुवीय विश्व

संदर्भ ग्रन्थ सूचीः–

1. हेजन — आधुनिक यूरोप का इतिहास
2. बी.आई. पाल — आधुनिक यूरोप का इतिहास
3. HAL Fisher — A History of Europe
4. Christopher — From Reformation to Industrial Revolution
5. A.J.P. Taylor — The origins of the second war
6. David Thompson — Europe, Nepolean
7. सत्यकेतु विद्यालंकार — एशिया का इतिहास
8. दीनानाथ वर्मा — आधुनिक यूरोप का इतिहास
9. Grant and Temperley — Europe in the 19th and 20th Century (also Hi—Version)
10. Kettelby — History of the Modern Times
11. Moon — Imperialism In World Politics
12. Plamor & Parkins — International Politics
13. Parks, Hengy Bamford — The United States of America A History
14. Panikkar K.M. — Asia and Western Dominance
15. Schuman — International Politics
16. Taylor, A.J.P. — Struggle for Mastery over Europe
17. Vinacke, H.M. — A History of Far East In Modern Times
18. Fay — Origins of the World War
19. के.एल.खुराना एवं शर्मा — विश्व का इतिहास
20. देवेन्द्र सिंह चौहान — समकालीन यूरोप
21. S.P. Nanda — History of Modern World
22. सुरेश चंद्र एवं शिवकुमार — आधुनिक विश्व का इतिहास
23. कालू राम शर्मा — आधुनिक विश्व
24. ई.एच.कार — दो विश्व युद्ध के बीच
25. जैन एवं माथुर — विश्व का इतिहास
26. अर्जुन देव, इंदिरा अर्जुन देव — समकालीन विश्व का इतिहास (1890–2008)
27. बी.एन.लुणिया — आधुनिक पाश्चात्य इतिहास की प्रमुख धाराएं (भाग–2)
28. कौलेश्वर राय — आधुनिक यूरोप (1789–1945)

Syllabus of Geography

(B.A./B. Sc. II Year)

Session

2019-2020
2020-2021

Brief Summary

3 Year Integrated UG Courses (B.A./ B.Sc.) in Geography

B.A. /B.Sc. Part I

The B.A. /B.Sc. Part-I Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper - I	Physical Geography
Paper - II	Human Geography.
Paper - III	Practical Geography

B.A. /B.Sc. Part-II

The B.A./B.Sc. Part-II Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper-I	Economic and Resources Geography
Paper-II	Regional Geography of India
Paper-III	Practical Geography

B.A. /B.Sc. Part III

The B.A. /B.Sc. Part III Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows

Paper – I	Remote Sensing and GIS
Paper - II	Geography of Chhattisgarh
Paper - III	Practical Geography

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

B.A. /B.Sc. Part II

PAPER - I

ECONOMIC AND RESOURCES GEOGRAPHY

Max. Marks: 50

(Paper Code-0187)

Unit I Meaning, scope and approaches to economic geography; Main concepts of economic geography; Resource: concept and classification; Natural resources: soil, forest and water.

Unit II Mineral resources: iron ore and bauxite; Power resources: coal, petroleum and hydro electricity; Resource conservation; Principal crops: wheat, rice, sugarcane and tea

Unit III Agricultural regions of the world (Derwent Whittlesey); Theory of agricultural location (Von Thunen); Theory of industrial location (Weber); Major industries: iron and steel, textiles, petrochemical and sugar; industrial regions of the world.

Unit IV World transportation: major trans-continental railways, sea and air routes; International trade: patterns and trends; Major trade blocks: LAFTA, EEC, ASEAN; Effect of globalization on developing countries.

Unit V **C**onservation of resources; evolution of the concept, principles, philosophy, and approach to conservation, resources conservation and practices. Policy making and sustainable development.

Books Recommended:

1. Alexander, J. W. (1988): Economic Geography. Prentice-Hall, New Delhi,.
2. Bryson, J., Henry, N., Keeble, D. and Martin, R. (eds.) (1999): The Economic Geography Reader: Producing and Consuming Global Capitalism. John Wiley and Sons, Inc, New York.
3. Clark,G. L., Gertler, M. S. and Feldman, M. P. (eds.) (2000): The Oxford Handbook of Economic Geography. Oxford University Press, USA.
4. Coe, N. (2007): Economic Geography: A Contemporary Introduction. Blackwell Publishers, Inc., Massachusetts.
5. Gautam, A. (2006): *Aarthik Bhugol Ke Mool Tattava*, Sharda Pustak Bhawan, Allahabad.
6. Guha, J. S. and Chattoraj, P.R. (2002): A New Approach to Economic Geography: A Study of Resources. The World Press Private Limited, Kolkata.
7. Hanink, D. M. (1997): Principles and Applications of Economic Geography: Economy, Policy, Environment. John Wiley and Sons, Inc, New York.
8. Hartshorne, T. A. and Alexander, J. W. (1988): Economic Geography (3rd revised edition) Englewood Cliff , New Jersey, Prentice Hall
9. Hudson, R. (2005): Economic Geographies: Circuits, Flows and Spaces. Sage Publications, London.
10. Knowles, R, Wareing, J. (2000): Economic and Social Geography Made Simple, Rupa and Company, New Delhi.

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

B.A. /B.Sc. Part II

PAPER - II
GEOGRAPHY OF INDIA
Max. Marks: 50
(Paper Code-0188)

Unit I Physical Features: Structure, Relief, Climate, Physiographic Regions, Drainage, Climate-origin and mechanism of monsoon, and regional and Seasonal variation.

Unit II Natural Resources: Soils - types, their distribution and characteristics. Water Resources (major irrigation and hydel power projects); Forests-types, distribution, economic significance and conservation. Mineral and Power resources-Iron-ore, Manganese, Copper, Coal, Petroleum and Natural gas, Non conventional sources of energy.

Unit III Cultural Features : Population - Growth, Density and Distribution. Agriculture - Major crops, impact of Green Revolution and Agricultural regions.

Unit IV Industries Localization, Development & Production - Iron and steel, Cotton Textile, Cement, Sugar, Transport, Foreign Trade. Industrial Region.

Unit V Detailed Study of the following regions of India : Kashmir Valley, North- East Region, Chhota Nagpur Plateau, Thar Desert, Islands of India.

Books Recommended:

1. Chauhan, P.R. and Prasad, M. (2003): *Bharat Ka Vrihad Bhugol*, Vasundhara Prakashan, Gorakhpur.
2. Farmer, B.H. (1983): An Introduction to South Asia. Methuen, London
3. Gautam, A. (2006): Advanced Geography of India, Sharda Pustak Bhawan, Allahabad
4. Johnson, B.L.C. (1963): Development in South Asia. Penguin Books, Harmondsworth
5. Krishnan, M.S. (1982): Geology of India and Burma, CAS Publishers and Distributors, Delhi.
6. Khullar, D.R. (2007): India: A Comprehensive Geography, Kalyani Publishers, New Delhi
7. Nag, P. and Gupta, S. S. (1992): Geography of India, Concept Publishing Company, New Delhi.
8. Rao, B.P. (2007): *Bharat kee Bhaugolik Sameeksha*, Vasundhara Prakashan, Gorakhpur.
9. Sharma, T.C. and Coutinho, O. (2003): Economic and Commercial Geography of India, Vikas Publishing House Private Ltd. New Delhi.
10. Singh , J. (2003): India: A Comprehensive Systematic Geography. Gyanodaya Prakashan, Gorakhpur
11. Singh, J. (2001): *Bharat: Bhougolik Aadhar Avam Ayam*, Gyanodaya Prakashan, Gorakhpur.
12. Singh, R.L. (ed.) (1971): India: A Regional Geography. National Geographical Society of India, Varanasi.
13. Spate, O.H. K., Learmonth A. T. A. and Farmer, B. H. (1996): India, Pakistan and Sri Lanka. Methuen, London, 7th edition.
14. SukhwaI, B.L. (1987): India: Economic Resource Base and Contemporary Political Patterns. Sterling Publication, New Delhi
15. Tiwari, R.C. (2007): Geography of India, Prayag Pustak Bhawan, Allahabad.
16. Wadia, D. N. (1959): *Geology of India*. Mac-Millan and Company, London and student edition, Madras.

27.5.19 (Dr. S. K. Das)

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B.A. /B.Sc. Part II
PAPER - III
PRACTICAL GEOGRAPHY
Max. Marks: 50

SECTION A

MAP INTERPRETATION, PROJECTIONS AND STATISTICAL METHODS (M.M. 25)

Unit I Distribution Maps: Dot Map, Choropleth Map and Isopleth Map.

Unit II Map Projections: Definition and classification; Conical, Zenithal, and Cylindrical Projections.

Unit III Interpretation of Weather Maps: Use of Meteorological Instruments.

Unit IV Statistical Methods: Quartile: Mean Deviation, Standard Deviation and Quartile Deviation; Relative Variability and Co-efficient of Variation.

SECTION B

SURVEYING (M.M. 15)

Unit V Surveying: Whole Circle Bearing and Reduced Bearing, Methods of Prismatic Compass Survey.

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.5.19 (Dr. S.K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी. –द्वितीय वर्ष
प्रश्न पत्र–प्रथम
आर्थिक एवं संसाधन भूगोल

(कोड क्रमांक 0187)

अधिकतम अंकः 50

इकाई–1 : आर्थिक भूगोल का अर्थ, विषय क्षेत्र एवं उपागम; आर्थिक भूगोल की आधारभूत संकल्पनाये; संसाधन : संकल्पनायें एवं वर्गीकरण; प्राकृतिक संसाधन : मिट्टी, वन एवं जल ।

इकाई–2 : खनिज संसाधन : लौह अयस्क एवं बाक्साईट; शक्ति संसाधन कोयला, पेट्रोलियम एवं जल विद्युत; संसाधन संरक्षण ; प्रमुख फसलेः गेहूँ, चाँवल, गन्ना, एवं चाय ।

इकाई–3 : विश्व के कृषि प्रदेश (व्हिटलसी के अनुसार); कृषि अवस्थिति के सिद्धान्त (वॉन थ्यूनेन); औधोगिक स्थानीयकरण का सिद्धान्त (वेबर); प्रमुख उद्योग : लौह एवं इस्पात, वस्त्र उद्योग, शैलरासायनिक एवं शक्कर; विश्व के औद्योगिक प्रदेश ।

इकाई–4 : विश्व परिवहन : प्रमुख ट्रांस महाद्वीपीय रेलवे, समुद्र एवं वायु मार्ग; अंतर्राष्ट्रीय व्यापार प्रतिरुप एवं प्रवृत्तियाँ; प्रमुख व्यापार संघ : लैटिन अमेरिकी स्वतंत्र व्यापार संघ (LAFTA), यूरोपीय साझा बाजार (EEC), दक्षिणी–पूर्वी एशियाई राष्ट्रों का संघ (ASEAN), विकासशील देशों पर भूमण्डलीकरण का प्रभाव ।

इकाई–5 : संसाधनों का संरक्षण; संकल्पनाओं का उद्‌भव, सिद्धात, दर्शन एवं संरक्षण के उपागम, संसाधन संरक्षण एवं प्रवृत्तियाँ, अक्षय विकास एवं नीति निर्माण ।

Books Recommended:

1. Alexander, J. W. (1988): Economic Geography. Prentice-Hall, New Delhi,.
2. Bryson, J., Henry, N., Keeble, D. and Martin, R. (eds.) (1999): The Economic Geography Reader: Producing and Consuming Global Capitalism. John Wiley and Sons, Inc, New York.
3. Clark,G. L., Gertler, M. S. and Feldman, M. P. (eds.) (2000): The Oxford Handbook of Economic Geography. Oxford University Press, USA.
4. Coe, N. (2007): Economic Geography: A Contemporary Introduction. Blackwell Publishers, Inc., Massachusetts.
5. Gautam, A. (2006): *Aarthik Bhugol Ke Mool Tattava*, Sharda Pustak Bhawan, Allahabad.
6. Guha, J. S. and Chattoraj, P.R. (2002): A New Approach to Economic Geography: A Study of Resources. The World Press Private Limited, Kolkata.
7. Hanink, D. M. (1997): Principles and Applications of Economic Geography: Economy, Policy, Environment. John Wiley and Sons, Inc, New York.
8. Hartshorne, T. A. and Alexander, J. W. (1988): Economic Geography (3rd revised edition) Englewood Cliff , New Jersey, Prentice Hall
9. Hudson, R. (2005): Economic Geographies: Circuits, Flows and Spaces. Sage Publications, London.
10. Knowles, R, Wareing, J. (2000): Economic and Social Geography Made Simple, Rupa and Company, New Delhi.

27.5.19 (Dr. S. K. Das) 27.5.19 27.05.19 Dr. R. Sharma

बी.ए./बी.एस.सी. द्वितीय वर्ष
प्रश्न पत्र– द्वितीय
भारत का भूगोल

(कोड क्रमांक 0188)

अधिकतम अंकः 50

इकाई –1 भौगोलिक स्वरूप – संरचना, उच्चावच जलवायु, भू–आकृतिक प्रदेश, अपवाह, जलवायु–मानसून की उत्पत्ति एवं विकास प्रक्रिया तथा पादेशिक एवं मौसमी विविधता।

इकाई –2 प्राकृतिक संसाधन – मिट्टियॉ, प्रकार, वितरण एवं विशेषताऍं, जल संसाधन, सिंचाई और बहुउद्देशीय परियोजनाएं, वन–प्रकार, वितरण आर्थिक महत्व एवं संरक्षण । खनिज एवं शक्ति के संसाधन – लौह अयस्क, मैग्नीज, तांबा, कोयला, प्रेट्रोलियम और प्राकृतिक गैस, गैर पारंपरिक उर्जा , (सौर उर्जा, पवन उर्जा ज्वारीय उर्जा, भूतापीय उर्जा)।

इकाई –3 सांस्कृतिक तत्व, जनसंख्या वृद्धि , घनत्व और वितरण, कृषि प्रमुख खाद्य फसलें, हरित क्रांति का प्रभाव, कृषि प्रदेश,।

इकाई –4 उद्योग–स्थानीकरण, औद्योगिक विकास और उत्पादन – लौहा और इस्पात उद्योग, सूती वस्त्र उद्योग, सीमेंट, चीनी ,यातायात और व्यापार, औद्योगिक प्रदेश ।

इकाई –5 भारत के निम्न प्रदेशों का विस्तृत अध्ययन कश्मीर घाटी, उत्तर पूर्वी प्रदेश, छोटा नागपुर का पठार, थार मरूस्थल भारत के द्वीप समूह।

Books Recommended:

1. Chauhan, P.R. and Prasad, M. (2003): *Bharat Ka Vrihad Bhugol*, Vasundhara Prakashan, Gorakhpur.
2. Farmer, B.H. (1983): An Introduction to South Asia. Methuen, London
3. Gautam, A. (2006): Advanced Geography of India, Sharda Pustak Bhawan, Allahabad
4. Johnson, B.L.C. (1963): Development in South Asia. Penguin Books, Harmondsworth
5. Krishnan, M.S. (1982): Geology of India and Burma, CAS Publishers and Distributors, Delhi.
6. Khullar, D.R. (2007): India: A Comprehensive Geography, Kalyani Publishers, New Delhi
7. Nag, P. and Gupta, S. S. (1992): Geography of India, Concept Publishing Company, New Delhi.
8. Rao, B.P. (2007): *Bharat kee Bhaugolik Sameeksha*, Vasundhara Prakashan, Gorakhpur.
9. Sharma, T.C. and Coutinho, O. (2003): Economic and Commercial Geography of India, Vikas Publishing House Private Ltd. New Delhi.
10. Singh , J. (2003): India: A Comprehensive Systematic Geography. Gyanodaya Prakashan, Gorakhpur
11. Singh, J. (2001): *Bharat: Bhougolik Aadhar Avam Ayam*, Gyanodaya Prakashan, Gorakhpur.
12. Singh, R.L. (ed.) (1971): India: A Regional Geography. National Geographical Society of India, Varanasi.
13. Spate, O.H. K., Learmonth A. T. A. and Farmer, B. H. (1996): India, Pakistan and Sri Lanka. Methuen, London, 7th edition.
14. SukhwaI, B.L. (1987): India: Economic Resource Base and Contemporary Political Patterns. Sterling Publication, New Delhi
15. Tiwari, R.C. (2007): Geography of India, Prayag Pustak Bhawan, Allahabad.
16. Wadia, D. N. (1959): *Geology of India*. Mac-Millan and Company, London and student edition, Madras.

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27/05/19

27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी. द्वितीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड–अ. मानचित्र की व्याख्या, प्रक्षेप और सांख्यिकीय विधियां । (25 अंक)

इकाई –1 मानचित्र – बिन्दु विधि, छाया विधि, सममान रेखा मानचित्र (मानचित्र निर्माण)

इकाई –2 प्रक्षेप – परिभाषा एवं प्रकार शंक्वाकार, खमध्य बेलनाकार प्रक्षेप.

इकाई –3 मौसम मानचित्र की व्याख्या एवं मौसम संबंधी उपकरणों का उपयोग.

इकाई –4 सांख्यिकीय विधियां – विचलन– चतुर्थांक माध्य विचलन, मानक विचलन, चतुर्थक विचलन, सापेक्षिक परिवर्तनशीलता, प्रसरण गुणंक।

खण्ड–ब. सर्वेक्षण (15 अंक)

इकाई –5 प्रिज्मीय सर्वेक्षण– पूर्णवृत दिक्मान, समानीत दिक्मान एवं प्रिज्मीय कम्पास सर्वेक्षण की विधियॉ।

प्रायोगिक पुस्तिका और मौखिक परीक्षा (10 अंक)

Books Recommended:

1. Alvi, Z. 1995 : Statistical Geography: Methods and Applications, Rawat Pub. New Delhi: .
2. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
3. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
5. Pal, S.K. 1999 : Statistics for Geoscientists, Concept publishing Company, New Delhi
6. Punmia, B.C.(1994): Surveying, Vol I, Laxmi Publications Private Ltd, New Delhi.
7. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition
8. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
9. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
10. Silk, J. 1979 : Statistical techniques in Geography, George Allen and Unwin, London
11. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
12. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.5.19 (Dr. S.K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

B.A. – II

P S Y C H O L O G Y

Paper	Name of the Paper	Max. Marks	Duration
I	Social Psychology	50	3 hrs.
II.	Psychological Assessment	50	3 hrs.
III.	Practicum	50	4 Hrs.

PAPER - I

SOCIAL PSYCHOLOGY (Paper Code-0189) M.M.:50

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Nature, Goal and Scope of Social Psychology; Methods of Social Psychology: Experimental, Survey, Interview, Observation, and Sociometric. Approaches to the study of social behavior: Psychoanalytic, Cognitive, and Behavioral.

UNIT-2 Social Perception: Perception of Self and Others, Impression Formation and its Determinant, Prosocial Behavior: Co-operation and Helping- Personal, Situational and Socio-cultural Determinants.

UNIT-3 Stereotypes: Nature and Determinants; Prejudice: Nature and Determinants; Attitudes: Nature and Measurement; Interpersonal Attraction and Determinants.

UNIT-4 Group Structure and Function: Social Facilitation, Conformity, Cohesiveness; Group Norms; Leadership: Nature, Types, Characteristics and Functions.

UNIT-5 Social Issues: Aggression- Determinants, Prevention and Control; Population Explosion- Nature and Consequences (Socio-cultural); Pollution; Corruption; Mob Behavior; Gender Discrimination and Child Labour.

References

1- सिंह,एअरू । कमार। समाज मनाविज्ञान की रूपरखा। मातीलाल बनारसीदास पकाषन।

2- मिश्रा एव जन। समान मनाविज्ञान क मल आधार। म.प. हिन्दी गथ अकादमी।

3- त्रिपाठी, लालबचन। समाज मनाविज्ञान की रूपरखा। हरपसाद भागव पकाषन।

4- Baron, R.A. & Byrne, D. Social Psychology. New Delhi: Prentice Hall Pub.

5- Secord, P.F. & Backman, C.W. (1994). Social Psychology. McGraw-Hill.

B. A. - II

PSYCHOLOGY PAPER- II

PSYCHOLOGICAL ASSESSMENT (Paper Code-0190) **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Psychological Assessment: Concept, Difference between Physical and Psychological Assessment, Levels of Assessment, Barriers in Psychological Assessment, Unidimensional and Multidimensional Assessment.

UNIT-2 Psychological Tests: Concept, Characteristics, and Types- Standardized and Non-standardised, Group, Performance and Verbal; Uses of Psychological Tests.

UNIT-3 Test Construction: Steps in Test Construction, Reliability- Test-retest, Split-half; Factors affecting Reliability; Validity: Content and Predictive; Factors affecting Validity; Norms- Age and Grade.

UNIT-4 Cognitive and Non-cognitive Tests: Cognitive- Introduction to Intelligence, Aptitude, and Achievement Testing; Non-Cognitive: Introduction to Personality, Interest, and Value Testing.

UNIT-5 Psychological Testing in Applied aspects of Life: Education, Occupation, Social, Health and Organization; Socio-Cultural factors in Psychological Assessment.

References

1- Anastasi (1997) Psychological Testing, New York: McGraw-Hill.
2- Ciminero, A.R. (1986) Handbook of Behavioral Assessment, New York: John Wiley.
3- Gupta, S.P. (2001). Manovaigyanik Mapan evam Moolyankan. Agra: Sharda Prakashan.

B. A. - II

PSYCHOLOGY PAPER- III

PRACTICUM **M.M.:50**

Note: This paper consists of two parts:

Part-A

(a) Comprises of Laboratory **Experiments**.
(b) Comprises of Psychological **Testing** and understanding of self and others.

(a) **Experiments** (Any five of the following):-

1. Effect of Group on Decision Making.
2. Social Facilitation.
3. Effect of Social setting on Sociometry.
4. Stereotypes.
5. Effect of Order of Information on Person-Perception.
6. Effect of Leadership on Performance.
7. Effect of Cognitive Dissonance on Attitude Change.
8. Effect of Communicator's Credibility on Suggestibility.

(b) **Psychological Tests** (Any four of the following):-

1. Aggression.
2. Deprivation.
3. Self-concept.
4. Dependence Proneness Scale.
5. Value.
6. Vocational Interest.
7. Attitude Scale.
8. Creativity.
9. Personality Test.

Part-B
Field Work

Each student will be required to visit a hospital/ industrial organisation/ educational institution etc. under departmental supervision and shall be preparing his/her observation report, revealing his/her psychological insight about group dynamics that is operational in the unit. This record constitutes a part of assessment of field visit. Measures of central tendency in group data and correlation- Rank order.

Distribution of Marks

A.	Conduction of Psychological Experiment and Reporting	15 marks.
B.	Administration of one Psychological Test and Reporting	15 marks.
C.	Evaluation of Practical note book of the Field-Work	10 marks.
D.	Viva-Voce	10 marks.

References Sharma, R. (2018) - Psycho-laboratory- Experiment and Test. Raipur: Vaibhav Prakshan.

22.6.19

22.06.2019

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व
Ancient India History, Culture and Archaeology

बी.ए. द्वितीय वर्ष

B.A. Part II Year

पाठ्यक्रम
Syllabus

सत्र : 2019–20

Session 2019-20

बी.ए. द्वितीय वर्ष
B.A. Part II Paper I

प्रथम : प्रश्न–पत्र

प्राचीन भारतीय सामाजिक तथा आर्थिक संस्थाएं (पेपर कोड 0134)

Ancient Indian Social and Economic Institution

पूर्णांक : 75

उद्देश्य : इस पाठ्यक्रम का उद्देश्य प्राचीन भारत की सामाजिक तथा आर्थिक संस्थाओं का सामान्य ज्ञान कराना है।

इकाई– 1 (1) वर्णाश्रम व्यवस्था (Varna System)
(2) आश्रम व्यवस्था (Ashramas)
(3) पुरूषार्थ चतुष्टय (Purushartha Chatushthaya)
(4) पंचमहायज्ञ (Pancha mahayagya)

इकाई– 2 (1) संस्कार (Sanskaras)
(2) विवाह तथा उसके प्रकार (Marriage and their types)
(3) परिवार की उत्पत्ति तथा महत्व, संयुक्त परिवार, पिता,माता, तथा पुत्र की स्थिति, पुत्रों के प्रकार
(Origin of Family and its Significance, Joint Family, position of Father, Mother and Sons; Types of Son)

इकाई– 3 (1) नारियों की स्थिति (Position of Women)
(2) शिक्षा–उद्देश्य, आदर्श, उपलब्धियॉ तथा प्रमुख शिक्षा केन्द्र
(Objectives of Education, Model, Achievements and Important education Centres)

इकाई– 4 (1) वैदिक काल से 600 ई.पू. तक प्राचीन भारत की आर्थिक दशा
(Economic Condition of Ancient India from Vedic age to 600 B.C.)
(2) श्रेणियों का संगठन और कार्य (Organisation and working of Guilds)
(3) 600 ई.पू. से 319 इ. तक प्राचीन भारत की आर्थिक दशा
(Economic Condition of Ancient India from 600 B.C. to 319 A.D.)

इकाई– 5 (1) 319 ई से 1200 ई. तक प्राचीन भारत की आर्थिक दशा
(Economic Condition of Ancient India from 319A.D. to 1200 A.D.)
(2) आंतरिक और बाह्य व्यापारिक मार्ग (Domestic and International trade routes)

सहायक ग्रंथ :

1. मनोरमा जौहरी – प्राचीन भारतीय वर्णाश्रम व्यवस्था
2. जयशंकर मिश्र – भारत की सामाजिक इतिहास
3. के.सी.जैन – प्राचीन भारतीय सामाजिक तथा आर्थिक संस्थाएं
4. राजबली पाण्डेय – हिन्दू संस्कार
5. हरिदत्त वेदालंकार – हिन्दू परिवार मीमांसा
6. ए.एस.अल्तेकर – प्राचीन भारत में नारियों की स्थिति
7. आर.एस.शर्मा – प्राचीन भारत में शूद्रों की स्थिति
8. ए.एस.अल्तेकर – प्राचीन भारतीय शिक्षण पद्धति
9. रमेशचन्द्र मजुमदार (अनु.कृष्णदत्त बाजपेयी) – प्राचीन भारत में संगठित जीवन
10. मोतीचन्द्र – सार्थवाह
11. कृष्णदत्त बाजपेयी – भारतीय व्यापार का इतिहास
12. कृष्णदत्त बाजपेयी – प्राचीन भारत का विदेशों में सबंध
13. आर.एस.शर्मा – पूर्व मध्यकालीन भारत में सामाजिक परिवर्तन
14. डॉ. चन्द्रदेव सिंह – प्राचीन भारतीय समाज और चिन्तन
15. सुस्मिता पाण्डेय – समाज, आर्थिक व्यवस्था एवम् धर्म
16. P.N. Prabhu - Hindu Social Organization
17. S.K. Maity - The Economics life of Northem India in the Gupta Period.
18. L.Gopal - Economic life of Northem Indian
19. D.R. Das - Econimics History of the Dean
20. शिव स्वरूप सहसा – प्राचीन भारतीय सामाजिक, आर्थिक संस्थाएं

31/05/19 31-5-19 31.5.19

31.05.19

बी.ए. द्वितीय वर्ष

द्वितीय : प्रश्न–पत्र

B.A. Part II Paper II

प्राचीन भारतीय राजनय तथा प्रशासन (पेपर कोड 0205)

Ancient Indian Polity and Administration

पूर्णांक : 75

इकाई– 1 राज्य की उत्पत्ति, प्रकार, स्वरूप तथा कार्य।
(Origin, types, form, and function of State)

इकाई– 2 राजपद, मंत्रिपरिषद्–संगठन एवं कार्य, सप्तांग सिद्धांत।
(Kingship; organisation and working of Council of Ministers; Theory of Saptanga)

इकाई– 3 गणराज्य : संगठन, शासन, पद्धति, गुण–दोष
(Republics: organisation, government, system, Pros & Cons)

इकाई– 4 अंतर्राष्ट्रीय संबंध, मण्डल सिद्धांत, षाडगुण्य सिद्धांत, दूत व्यवस्था, गुप्तचर व्यवस्था।
(International Relation, Principle of Mandala, Principle of Shadgunya, Ambassadors, Espionage)

इकाई– 5 विभिन्न राजवंशों की प्रशासन व्यवस्था :
मौर्य, गुप्त, हर्ष कालीन वंश की प्रशासन, राष्ट्रकूट एवं चोलवंश।
(Administrative system of various Dynasties: Mauryas, Guptas, period of Harsha, Rashtrakutas and Cholas)

अनुशंशित पुस्तके :

1. अनंत सदाशिव अल्तेकर – प्राचीन भारतीय शासन पद्धति (Ancient Indian Administration)
2. काशी प्रसादा जायसवाल – हिन्दू राजतंत्र, भाग 1, 2 (Hindu Polity)
3. डॉ. रवींन्द्रनाथ अग्रवाल – मध्यप्रदेश क्षेत्र के अंतर्राज्यीय संबंधों का अध्ययन
4. सत्यकेतु विद्यालंकर – प्राचीन भारतीय शासन व्यवस्था एवं राज्य शास्त्र
5. मनोरमा जौहरी – प्राचीन भारत में राज्य और शासन व्यवस्था
6. हरिशचन्द्र शर्मा – प्राचीन भारतीय राजनीतिक विचारक एवं संस्थाएं
7. राधाकृष्ण चौधरी – प्राचीन भारतीय राजनीति एवं शासन व्यवस्था

सत्र 2019–20 से प्रस्तावित

बी.ए. द्वितीय वर्ष

संस्कृत साहित्य

टीप – बी.ए. द्वितीय वर्ष में संस्कृत साहित्य के दो प्रश्न–पत्र होंगें एवं दोनों प्रश्न –पत्र 75– 75 अंकों के होंगें ।

प्रथम प्रश्नपत्र

नाटक, व्याकरण तथा रचना — पूर्णांक – 75

इकाई –1	नागानन्द, नाटकम् (हर्षवर्धनकृत) 1. एक ससन्दर्भ व्याख्या 2. दो सूक्तियों की व्याख्या	अंक – 15
इकाई –2	नागानन्द नाटकम् – समीक्षात्मक प्रश्न	अंक – 15
इकाई –3	व्याकरण (लघुसिद्धान्तकौमुदी) कर्तृवाच्य, कर्मवाच्य, भाववाच्य	अंक – 15
इकाई –4	व्याकरण (लघुसिद्धान्तकौमुदी) समास प्रकरण	अंक – 15
इकाई –5	वाक्यरचना व्याकरण के अधीत अंश पर आधारित छह संस्कृत शब्दों से वाक्यरचना	अंक – 15

अनुशंसित ग्रन्थ –

1. नागानन्द नाटक – हर्षवर्धन, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी
2. रचनानुवाद कौमुदी – डा. कपिलदेव द्विवेदी
3. संस्कृत में अनुवाद कैसे करें – उमाकान्त मिश्र शास्त्री, प्रकाशक – भारती भवन
4. लघु सिद्धान्त कौमुदी – श्रीधरानन्द शास्त्री
5. लघु सिद्धान्त कौमुदी – श्री महेश सिंह कुशवाहा, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी
6. शीघ्रबोधव्याकरणम् – डा. पुष्पा दीक्षित, पाणिनीय शोध संस्थान, तेलीपारा, बिलासपुर

31/05/19

सत्र 2019–20 से प्रस्तावित

बी.ए. द्वितीय वर्ष

संस्कृत साहित्य

द्वितीय प्रश्नपत्र

नाटक, व्याकरण और अनुवाद — पूर्णांक – 75

इकाई –1 रघुवंशमहाकाव्यम् (द्वितीय सर्गः) — अंक – 15

दो श्लोकों की व्याख्या

इकाई –2 रघुवंशमहाकाव्य के समीक्षात्मक प्रश्न — अंक – 15

इकाई –3 नीतिशतकम् (भर्तृहरिकृत) — अंक – 15

दो श्लोकों की व्याख्या

इकाई –4 साहित्येतिहासः — अंक – 15

नाटक, महाकाव्य तथा गद्यकाव्य –

अभिज्ञानशाकुन्तल, उत्तररामचरित, वेणीसंहार, मुद्राराक्षस, मृच्छकटिक, रघुवंश, कुमारसंभव, बुद्धचरित, सौन्दरनन्द, पद्मचूडामणि, सुग्रीववध, किरातार्जुनीय, भट्टिकाव्य, जानकीहरण, शिशुपालवध, नैषधीयचरित, हरविजय, नवसाहसांकचरित, विक्रमांकदेवचरित, राजतरंगिणी ।

वासवदत्ता, दशकुमारचरित, कादम्बरी, हर्षचरित, तिलकमंजरी, गद्यचिन्तामणि, शिवराजविजय ।

इकाई –5 साहित्येतिहासः — अंक – 15

गीतिकाव्य, मुक्तक तथा कथा साहित्य –

शतकत्रय (भर्तृहरि), ऋतुसंहार, मेघदूत, अमरुकशतक, गीतगोविन्द, भामिनीविलास, पंचलहरी, नलचम्पू, रामायणचम्पू, भारतचम्पू, वरदाम्बिकापरिणय, पंचतंत्र, हितोपदेश, बेतालपंचविंशति, शुकसप्तति, कथासरित्सागर, बृहत्कथामंजरी, कथामुक्तावली, इक्षुगन्धा ।

(उल्लिखित रचनाओं एवं रचनाकारों का सामान्य परिचय अपेक्षित है ।)

अनुशंसित ग्रन्थ –

1. रघुवंशमहाकाव्य – कालिदास, प्रकाशक – मोतीलाल बनारसीदास
2. नीतिशतकम् – भर्तृहरि, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी
3. संस्कृत साहित्य का इतिहास – आचार्य बलदेव उपाध्याय
4. संस्कृत साहित्य का अभिनव इतिहास – डा. राधावल्लभ त्रिपाठी, वि.वि. प्रकाशन, सागर, म.प्र.

31/05/19

भाषाविज्ञान
प्रथम प्रश्न–पत्र
वाक्य– अभिरचनाएं
(पेपर कोड – 0177)

1. हिन्दी की व्याकरणिक कोटियां–शब्दवर्ग, पुरूष, लिगं, वचन, कारक, काल, वृत्ति–परिभाषा तथा सोदाहरण विवेचना।
2. भाषित रूप – अर्थ–तत्व व संबंध–तत्व । संबंध–तत्व के प्रकार एवं कार्य । रूपिम के प्रकार, रूपिम–निर्धारण–व्यतिरेकी विवरण, परिपूरक वितरण।
3. भाषित संकेत – समाजभाषाविज्ञान के संदर्भ में, ' लांग' तथा 'पैरोल' । भाशा के अध्ययन के प्रकार – एककालिक, बहुकालिक, तुलनात्मक, व्यतिरेकी तथा अनूप्रयुक्त।
4. पदबंध उपकाव्य तथा वाक्य – पदबंध का वर्गीकरण – संज्ञा–पदबंध, सर्वनाम – पदबंध, विशेषण–पदबंध, क्रिया – पदबंध, क्रियाविशेषण – पदबंध आदि।

   उपवाक्य का वर्गीकरण – संज्ञा–उपवाक्य, विशेषण – उपवाक्य, क्रियाविशेषण, उपवाक्य आदि । वाक्यों का वर्गीकरण–विभिन्न आधार।
5. कारक – कर्ता, कर्म, करण, आदि अन्वय ं काल, पक्ष, भाव, वाच्य, पदक्रम, – वाक्य–विन्यास – निकटस्थ अवयव विश्लेश्ण, रूपान्तरण–प्रजनक व्याकरण । हिंन्दी के वाक्यों में होने वाली अशुध्दियों का संशोधन।

निर्धारित पुस्तकें –

1. भाषाविज्ञान – भोलानाथ तिवारी (किताब महल, इलाहाबाद)
2. भाषाविज्ञान एवं भाषाशास्त्र – डॉ. कपिलदेव व्द्विवेदी (विश्वविद्यालय प्रकाशन, वाराणसी)
3. भाषाविज्ञान सैंध्दांतिक चिंतन – रविन्दंनाथ श्रीवास्तव
4. आधुनिक हिन्दी व्याकरण और रचना ' वासुदेवनंदल प्रसाद
5. अच्छी हिंदी – रामचंद्र वर्मा
6. भाषाशास्त्र की रूपरेखा – उदानारायण तिवारी

भाषाविज्ञान
द्वितीय प्रश्न पत्र
कोशविज्ञान एवं अर्थविज्ञान
(पेपर कोड – 0178)

1. कोशविज्ञान – परिभाषा, उद्देश्य, विषय–क्षेत्र, विज्ञान है या कला, कोशविज्ञान का अन्य विषयों से संबंध, कोशों के अध्ससन के आधार – ऐतिहासिक, तुलनात्मक आदि।
2. कोश – निर्माण की विधियां, शब्द– संकलन के आधार, प्रविष्टियों का चयन, क्रम–विन्यास, कोश–निर्माण में होने वाली समस्याएं।
3. शब्दाकोश के प्रकार – भाषा के आधार पा – एकभाषिक, द्विभाषिक, त्रिभाषिक, बहुभाषिक आदि : काल के आधार पर – समकालिक, ऐतिहासिक आदि । कोशीय अर्थ का निर्धारण–पर्यायवाची, अनेकार्थी, अनेकार्थ, लक्षणार्थ, समध्वनि, विलोमार्थ, संदर्भपरक, अर्थ आदि । शब्दकोश की विशेषताएं।
4. अर्थीय संबंध – शब्द और अर्थ के बीच संबंध, अर्थ के प्रकार अर्थ परिवर्तन की दिशाएं– अर्थ–विस्तार, अर्थसंकोच, अर्थादेश आदि। अर्थ–परिवर्तन के विभिन्न कारण।
5. हिन्दी शब्दों का प्रयोग और अर्थ –ऊनार्थक (लघुतावाची) शुद्ध, पर्यायवाची शब्द, समूहवाची शब्द, ध्वनिमूलक शब्द (सजीव तथा निर्जीव से संबंधित) समध्वनि मूलकशब्द, मुहावरें तथा लाकोक्तियों का अर्थ और प्रयोग ।

निर्धारित पुस्तकें–

1. कोशविज्ञान – भोलानाथ तिवारी
2. आधुनिक हिन्दी व्याकरण और रचना – वासुदेवनंदन प्रसाद
3. अच्छी हिन्दी – रामचंन्द्र वर्मा
4. शुद्ध हिन्दी – हरदेव बाहरी

B.A. IInd Year

MUSIC

PAPER – I

SESSION – 2019-20

THEORY OF INDIAN MUSIC-VOCAL / INSTRUMENTAL

(Paper Code-0201)

UNIT-I (a) Definitions and study of the following terms : Graha, Ansha, Nayas Swara, Paryayansha Swara, Alpatva-Bahutva, Aavirbhava-Tirobhava, Gandharva-Gan, Nibaddha-Anibaddha Gan, Jamjama, Ghaseet, Krintan, Shuddha, Chayalag, Sankirna Raga.

(b) Swasthan Niyam, Ragalap, Aalapti, Akshiptika, Samvadatva.

UNIT-II Short Biographics and contributions of the Musicians :- Sharangdeva, Acharya Bharat, Ahobal, Vyankatmakhi, Sadarang-Adarang. Aalauddin Khan, Faiyaz Khan, Imdad Khan, Pt. Ravi Shankar.

UNIT-III Notation of Talas with Dugun and Chaugun Layakaries :-
Roopak, Teevra, Sultal, Deepchandi, Jhumra, Adachautal, Dhamar, Tilwara.

UNIT-IV (a) Study of Karnatak Taal System,

(b) Comparative study of Karnatak and Hindustani Taal System.

UNIT-V Definition of Vaggeyakar, Uttam Vaggeykar, Adham Vaggeykar.
Classification of Instruments :- Tat, Vitat, Ghan, Shushir vadya.

14/06/19

PAPER - II

THEORY OF INDIAN MUSIC VOCAL/INSTRUMENTAL **M.M. : 50**

(Paper Code-0202)

SESSION – 2019-20

UNIT-I Elementry of Medium-Sound, Musical Sound and Noice, Vibratory motions, Frequency, Pitch, Magnititude and Timber, Major Tone, Minor Tone, Semi Tone.

UNIT-II Study of Melas or Thatas as follows :

(a) 72 Melas of Vyankatmakhi

(b) 32 Thatas of V.N. Bhatkhande

UNIT-III History of Indian Music as follows :

(a) Origin of Music

(b) Vedic, Pauranik and Gupta Period a short survey

UNIT-IV(a) Explanation of the following terms :
Kajari, Chaiti, Rabindra Sangeet, Tribal Music, Lawani, Garba, Baul, Bhatiyali, Mand.

(b) Merits of a good listener, Qualities of a good listener to make any music programme a success.

UNIT-V (a) Study of theoritical details of Ragas prescribed for practical course : Bihag, Kedar, Desh, Bageshwari, Malkauns, Jaunpuri, Bhairavi, Hameer, Kalingda, Kamod, Chhayanat.

(b) Writing in notation of songs (Bandish) or gats prescribed in practical course of Second year.

(c) Writing of a critical appreciation of Radio or T.V. Music (Classical) Programme.

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PRACTICAL

VOCAL/INSTRUMENT M.M. : 50

1. Study of the following Ragas : Bihag, Kedar, Desh, Bageshwari, Malkauns, Jaunpuri, Bhairavi, Hameer, Kalingda, Kamod, Chhayanat .

2. Two Vilambit Khayalas/Maseet Khani Gat, with Alap and Tanas or Todas. One Choice of the candidate and one vilambit asked by the examiner. 10 marks

3. Sargam geet and Lakshan geet in all the above Ragas. Playing of a Gat in Jhaptal and Rupak Tal. 3 + 3 = 6

4. Drut Khayal or Raza Khani Gat with Tanas or Todas in any five of the above mentioned Ragas. 4 + 4 = 8

5. Singing of a Dhrupad Dhamar with Layakaris or playing a Gat in other than Teen Tal. 8 marks

6. Study of the following Talas :

Roopak, Teevra, Sooltaal, Deepchandi, Jhumra, Adachautal, Dhamar, Tilwara.
Demonstration of Talas with Dugun Chaugun. 4 marks
Singing of Tarana/Playing of Bol or Jhala 4 marks

SESSIONAL WORK M.M. : 10

1. Keeping up to date Practical and Theory note books. Attendence in Class and performance in college classes.
2. Ten descriptions of Music Programmes in Radio, T.V. or Personally attended. Participation in Departmental activities.

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BOOKS RECOMMENDED: -

1. Hindustani Sangeet Paddhati Kramik Pustak Malika (Part-1-4) By V.N. Bhatkhande.
2. Sangeet Visharad, by Vasant.
3. Sangeet Bodh, by S.S. Paranjape.
4. Sangeet Shastra Darpan, By Shanti Govardhan Part I + II
5. Rag Bodh, By B.R. Deodher Part I, II, III
6. Bharatiya Sangeet, Ka Itihass by Umesh Joshi. By Dr. S.S. Paranjape.
7. Sangeet Shastra 1 + 2 + 3 by Mahesh Narayan Saxena.
8. Sangeet Shastra 1, 2, 3 by V.N. Bhatkhande.
9. Sangeetanjali, by Pt. Omkar Nath Thakur.
10. Sitar Malika, by Bhagwat Sharan Sharma.
11. Taal Prakash by Bhagwat Saran.
12. Dhwani Aur Sangeet by Lalit Kishore Singh.

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EDUCATION

PAPER - I

EDUCATION & INDIAN HERITAGE (Paper Code-0193) **M.M. 75**

UNIT-I Education in India during (a) Vedic (b) Budhastic and (c) Medival Periods.

UNIT-II Macavleys Minutes & Bentinik Resolution (1835), Adam's Report and its recommendation wood's despatch (1854).

Lord Curzon's educational policy, Growth of national consciousness, National education movement.

UNIT-III Report of Hunter Commission, its influence in the subsequent development of education. Ghokhle's Bill.Sadler Commission's recommendation.

UNIT-IV Wardha Scheme of education 1937. RadhaKrishanan Commission 1948, Mudaliar Commission (1952-53).

UNIT-V Kothari Commission 1964-66, New education policy 1986 and its revised formulation of 1992, Gujrat Vidya Peeth, Basic education, Visva Bharti.

PAPER - II

EDUCATION AND HUMAN DEVELOPMENT (Paper Code-0194) MM. 75

COURSE OBJECTIVES

To make the students understand about -

1. The meaning, scope and uses of psychology in education.
2. Human growth and development upto the stage of adolescence.
3. Meaning and purpose of learning and factors influencing learning.
4. The concept of intelligence, its meaning and measurement.
5. Heredity and environment and their roles in causing individual differences.

COURSE CONTENTS

UNIT-I Pshchology- Its meaning, nature and scope. Relationship between education and psychology. Distinction between psychology and educational psychology.

UNIT-II Stages of human development : infancy, Childhood, latency and adolescene- their needs, significance and problems. Human development and education, role of educational psychology in understanding the individual.

UNIT-III Learing : Learning and maturation, Essential aspects of different theories and laws of learning, motivation in learning, transfer of learning.

Attention and Interest. Nature and conditions for attention, their educational implications.Emotions - their meening, characteristics and place of emotions in education.

UNIT-IV Personality Meanining & Factors. Intelligence - concept, definition and measurement.Habits, meaning of habit and its role and implications in education's.

UNIT-V Heredity and invironment and their implications for education.

Individual differences - causes of individual differences, significance of individual differences and educational implications.

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –II
Subject: Statistics
Paper-I(Paper Code-0853)
Statistical Methods

Unit I

Sampling from a distribution: Definition of a random sample, simulating random sample from standard distributions (uniform, Normal, Exponential), concept of derived distributions of a functions of random variables, concept of a statistics and its sampling distribution. Point estimate of a parameter. Properties of a good estimator, Concept of bias and standard error of an estimate .Standard errors of sample mean, sample proportion. **S**ampling distribution of sum of Binomial, Poisson and mean of Normal distributions. Independence of sample mean and variance in random sampling from a Normal distribution (without derivation).

Unit II

Statistical tests and interval estimation: Null and alternative hypothesis. Types of errors, level of significance, p values, one and two tailed tests, Procedure for testing of hypothesis. Statement of chi-squares, Student's t and F statistics. Testing for the single mean and variance of a univariate normal distribution, testing the equality of two means and testing for the equality of two variances of two univariate normal distributions. Related confidence intervals. Testing for the significance of sample correlation in sampling from bi-variate normal distribution and for equality of means and equality of variances in sampling from bivariate normal populations.

Unit III

Large sample tests: use of central limit theorem for testing and interval estimation of a single mean and a single proportion and difference of two means and two proportions, Fisher's Z transformation and its uses. Pearson's chi-square test for goodness of fit and for homogeneity for standard distributions. Contingency table and test of independence in a contingency table.

Unit IV

Nonparametric tests: Definition of order statistics and their distributions, Non-parametric tests, Sign test for univariate and bivarite distributions, Wilcoxon test, Mann-Whitney test, Run test, median test and Spearman's rank correlation test.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Frund J.E. (2001) Mathematical Statistics, Prentice Hall of India.
2. Goon A.M., Gupta M.K., Das Gupta.B. (1991): Fundamentals of Statistics, Vol.I, World Press, Culcutta.
3. Gupta and Kapoor: Fundamentals of Mathematical Statistics S.Chand & Sons.
4. Hodges, J.L. and Lehman E.L. (1964): Basic Concepts of Probability and Statistics, Holden Day.
5. Mood A.M, Graybill F.A and Boes D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.

ADDITIONAL REFERENCES

1..Bhat B.R., Shrivenkatramana T and Rao Madhava K.S. (1997): A Beginner's Text, Vol. II, New age International (P) Ltd.

2. Rohatgi, V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

3. Snedecor, G.W. and Cochran W.G. (1967): Statistical Methods. Lowa State University Press.

Paper-II (Paper Code-0854)
Sampling Theory and Design of Experiments

Unit I
Concepts of population and sample, need for sampling ,Census and sample survey , Basic concepts in sampling , organizational aspects of survey sampling, sample selection and sample size .
Some basic sampling methods – simple random sampling (SRS) with and without replacement.

Unit II
Stratified random sampling , Systematic sampling , Allocation problems, ratio and regression methods of estimation under SRS.
Non-sampling errors, aquitance of working (questionnaires, sampling design, methods followed in field investigation, principal findings, etc) of NSSO and other agencies undertaking sample surveys.

Unit III
Analysis of variance for one way and two-way classifications. Need for design of experiments, fundamental principal of design, basic designs- CRD, RBD, LSD and their analysis.

Unit IV
Missing plot technique. Analysis of co-variance. Factorial experiments : 2^2, 2^3 factorial experiments, illustrations, main effects and interactions, confounding and illustrations. Yates method of finding treatment totals.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Cocran W.G. (1977): Sampling Techniques, John Wiley and Sons.
2.Des Raj (2000): Sample Survey Theory, Narosa Publishing House.
3.Murthy M.N(1967): Sampling Theory and Methods, Statistical Publishing Society, Calcutta.
4.Singh, D. and Chaudhary,F.S. (1986): Theory and analysis of Sample Survey Designs. New Age International Publisher.
5.Sukhatme P.V., Sukhatme B.V., Sukhatme S. and Ashok C.(1984), : Sample Survey Methods and Its Applications, Indian Society of Agricultural Statistics, New Delhi.
6. Das M.N. and Giri (1986) : Design and analysis of experiments,springer verlag.
7.Goon A.M.,Gupta M.K.,Das Gupta B. (1986): Fundamentals of Statistics, Vol.II, World Press, Culcutta.
8. Joshi,D.D.(1987):Linear Estimation and Design of Experiments,Wiley Eastern.
9. Kempthorne O.(1965) : The Design and Analysis of Experiments,Wiley Eastern.

Paper III:

Practical : Practicals Based on Paper I & II

1. drawing random samples from standard univariate discrete and continuous distributions such as Binomial, Poission, Normal, Cauichy and Exponential.
2. Tests of significance based on Student's t, Chi-square, F. Test of significance of sample correlation coefficient. Use of Z Transformation.Testing of equality of means and equality of variance in sampling from bivariate normal.
3. Large sample tests for means and proportions, tests of goodness of fit and independence of attributes in contingency tables.
4. Nonparametric tests: Sign, Run, Median, Wilcoxon, Mann-Whitney tests.
5. Selection of samples and determination of sample size. Simple random sampling, Statified and systematic sampling. Allocation problem in stratified sampling. Ratio and regression methods of estimation.
6. Analysis of variance for one way and two way classifications. Analysis of CRD, RBD and LSD. Analysis of 2^2 and 2^3 experiments.

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.A. Part-II
Paper-I
ADVANCED CALCULUS

UNIT-I Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion. Series of non-negative terms. Comparison tests, Cauchy's integral test, Ratio tests, Raabe's, Logarithmic, De Morgan and Bertrand's tests. Alternating series, Leibnitz's theorem. Absolute and conditional convergence.

UNIT-II Continuity, Sequential continuity, Properties of continuous functions, Uniform continuity, Chain rule of differentiability, Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives, Taylor's theorem with various forms of remainders.

UNIT-III Limit and continuity of functions of two variables. Partial differentiation. Change of variables. Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables. Jacobians.

UNIT-IV Envelopes, evolutes. Maxima, minima and saddle points of functions of two variables. Lagrange's multiplier method.

UNIT-V Beta and Gamma functions, Double and triple integrals, Dirichlet's integrals, Change of order of integration in double integrals.

REFERENCES :

1. Gabriel Klaumber, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. R.R. Goldberg, Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970.
4. D. Soma Sundaram and B. Choudhary, A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
6. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
7. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York.
8. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
9. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
10. O.E. Stanaitis, An Introduction to Sequences, Series and Improper Integrals, Holden-Dey, Inc., San Francisco, California.
11. Earl D. Rainville, Infinite Series, The Macmillan Company, New York.
12. Chandrika Prasad, Text Book on Algebra and Theory of Equations, Pothishala Pvt. Ltd., Allahabad.
13. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
14. Shanti Narayan, A Course of Mathematical Analysis, S.Chand and Company, New Delhi.

B.A. Part-II
Paper-II
DIFFERENTIAL EQUATIONS

UNIT-I Series solutions of differential equations- Power series method, Bessel and Legendre functions and their properties-convergence, recurrence and generating relations, Orthogonality of functions, Sturm-Liouville problem, Orthogonality of eigen-functions, Reality of eigen values, Orthogonality of Bessel functions and Legendre polynomials.

UNIT-II Laplace Transformation- Linearity of the Laplace transformation, Existence theorem for Laplace transforms, Laplace transforms of derivatives and integrals, Shifting theorems. Differentiation and integration of transforms. Convolution theorem. Solution of integral equations and systems of differential equations using the Laplace transformation.

UNIT-III Partial differential equations of the first order. Lagrange's solution, Some special types of equations which can be solved easily by methods other than the general method, Charpit's general method of solution.

UNIT-IV Partial differential equations of second and higher orders, Classification of linear partial differential equations of second order, Homogeneous and non-homogeneous equations with constant coefficients, Partial differential equations reducible to equations with constant coefficients, Monge's methods.

UNIT-V Calculus of Variations- Variational problems with fixed boundaries- Euler's equation for functionals containing first order derivative and one independent variable, Extemals, Functionals dependent on higher order derivatives, Functionals dependent on more than one independent variable, Variational problems in parametric form, invariance of Euler's equation under coordinates transformation.

Variational Problems with Moving Boundaries- Functionals dependent on one and two functions, One sided variations.

Sufficient conditions for an Extremum- Jacobi and Legendre conditions, Second Variation. Variational principle of least action.

REFERENCES :

1. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999.
2. D.A. Murray, Introductory Course on Differential Equations, Orient Longman, (India), 1967.
3. A.R. Forsyth, A Treatise on Differential Equations, Macmillan and Co. Ltd., London.
4. Lan N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill Book Company, 1988.
5. Francis B. Hilderbrand, Advanced Calculus for Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 1977.
6. Jane Cronin, Differential equations, Marcel Dekkar, 1994.
7. Frank Ayres, Theory and Problems of Differential Equations, McGraw-Hill Book Company, 1972.
8. Richard Bronson, Theory and Problems of Differential Equations, McGraw-Hill, Inc., 1973.
9. A.S. Gupta, Calculus of variations with-Applications, Prentice-Hall of India, 1997.
10. R. Courant and D. Hilbert, Methods of Mathematical Physics, Vots. I & II, Wiley-Interscience, 1953.
11. I.M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice-Hill, Englewood Cliffs (New Jersey), 1963.
12. A.M. Arthurs, Complementary Variational Principles, Clarendon Press, Oxford, 1970.
13. V. Kornkov, Variational Principles of Continuum Mechanics with Engineering Applications, Vol. I, Reidel Publ. : Dordrecht, Holland, 1985.
14. T. Oden and J.N. Reddy, Variational Methods in Theoretical Mechanics, Springer-Verlag, 1976.

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B.A. Part-II
Paper-III
MECHANICS

STATICS

UNIT-I Analytical conditions of Equilibrium, Stable and unstable equilibrium. Virtual work, Catenary.

UNIT-II Forces in three dimensions, Poinsot's central axis, Null lines and planes.

DYNAMICS

UNIT-III Simple harmonic motion. Elastic strings. Velocities and accelerations along radial and transverse directions, Projectile, Central orbits.

UNIT-IV Kepler's laws of motion, velocities and acceleration in tangential and normal directions, motion on smooth and rough plane curves.

UNIT-V Motion in a resisting medium, motion of particles of varying mass, motion of a particle in three dimensions, acceleration in terms of different co-ordinate systems.

REFERENCES :

1. S.L. Loney, Statics, Macmillan and Company, London.
2. R.S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a particle and of rigid bodies, Cambridge University Press, 1956.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	ARCHAEOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Archaeological Anthropology, branches of Archaeology: Classical Archaeology, Historical Archaeology, Prehistoric Archaeology and Protohistoric Archaeology. Anthropology as Archaeology. Differences between the Old world and new world Archaeological Traditions. Absolute and Relative Dating.

UNIT – II Geological time scale. The Great Ice Age
Stratigraphy and other evidences of Ice Age: River terraces. Moraines etc. Pluvial and interpluvials
Stone Age tools: Types and Technology.

UNIT – III Age of Paleolithic savagery:
European lower Paleolithic period: Stone tools and cultures
Indian lower Paleolithic period: Sohan Culture & Madrasian Culture.
European Middle Paleolithic Period: Tools & culture; Flake took complex in India
European Upper Paleolithic period; Tools and Culture, main characteristics of the European Paleolithic Home and Cave art and its significance.

UNIT – IV Mesolithic complex in North Europe. Mesolithic complex in Western Europe, Mesolithic Culture in India. Chief feature of Neolithic revolution. Neolithic complex in India.

UNIT – V Metal Age: Copper, Bronze and Iron Age
Urban revolution: General Features
Indus valley civilization: Main Features, Town Planning, Economic activities, origin and decay

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B.A. /B.Sc. – Second Year
Session: 2019-20

Name of the Subject :- Anthropology
Paper : - Second
Name of the Paper :- TRIBAL CULTURE OF INDIA
Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I Define tribe and scheduled tribe. Geographical distribution of Indian tribes and their racial and linguistic classification. Contribution of Anthropology in the study of Indian tribes.

Sacred complex, Universalisation and parochialisation, Sanskritisation, westernization, dominant caste.

Tribes and caste, Difference between S.C. and S.T.

Particularly Vulnerable Trible Group (PVTG) of Chhattisgarh (Kamar, Birhor, Hill Korwa. Abujhmariya, Baiga)

UNIT-II Primitive economy:-

Stages of tribal economy: Hunting, food gathering, fishing, shifting and settled agriculture.

Concept of Property and ownership in tribal societies

Problems of tribal people: land alienation, bonded labour, indebtedness, shifting cultivation, irrigation, Unemployment, agricultural labour; Forest and Tribals

New economic anthropology: Exchange- Gifts, barter, trade, ceremonial exchange and market economy

UNIT-III The problems of culture contact: Problems due to urbanization and industrialization, Regionalism

Tribal religion: origin & function, animism, totemism.

Concept and practices of Magic and witchcraft, shamanism, head hunting.

UNIT-IV Political organisation of Indian tribes: Distinction between state and stateless society, law in primitive society

Social organization of Indian Tribes: Matriarchal and patriarchal family,. Lineage and clan, Ways of acquiring mates in tribal societies.

Youth dormitories: Type, organisation and functions.

UNIT-V Tribal development: History of tribal development, the constitutional safeguards for the scheduled tribes.

Tribal problem: isolation, migration, acculturation, detribalization.

Policies, plans and programmes of tribal development and their implementation. Tribal revolts in India.

Contributions of anthropology to tribal development.

Response of the tribal people for development programs of government and NGO

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Recommended Readings:

1. Chaudhary, Bhudadeb (Ed.). Tribal Development in India.
2. Elwin,V.A. Philosophy for NEFA.
3. Haimendorf. The Tribes of India: Struggle for survival.
4. Shara B.D. Basic Issues in tribal Development.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - Practical

Name of the Paper :- MATERIAL CULTURE AND RESEARCH TOOLS

Total Marks : 50 Pass Marks : 17

OBJECTIVES :

The objective of this practical course is to introduce the student with the primitive material culture and technology used by primitive man and the student will be introduced with various techniques commonly used by social Anthropology.

MATERIAL CULTURE :

Part – I. Identification and technological descriptions of the following.

1. Implements for food gathering, hunting, fishing and agriculture
2. Fire making implements
3. Types of habitations
4. Land and water transport

Part-II Sketching, identification and the description of Paleolithic, Mesolithic and Neolithic tools

(It is essential that students should draw at least five tools of each age)

Part- III Construction of schedule, Geneology and Questionnaire

Each student should collect information through above tools from 10 Respondents.

The Student will be required to maintain practical records of all work done in the practical class.

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पाठ्यक्रम उर्दू अदब
बी.ए. भाग – 2

नोट– इस इस्तेमाल में दो पर्चे होंगे । हर पर्चा 75 का होगा।

1. नस
2. शायरी

पहला पर्चा नस
(पेपर कोड – 0199)
(खत निगारी, तन्जोमिजाह, तन्कीद)

निसाब :

खत निगारी:

1. खुतूते गालिब : ऊर्दूए मोअल्ला और ऊदे हिन्दी से तीन खत
2. खुतूते मेहदी इफादी : सहीकए मुहब्बत से तीन खते
3. मुतूते अबुल कलाम आजाद : गुबारे खातिर से तीन खते

तन्जो पिजाह:

1. खाजो का किरदार : फसानए आजाद से अज पं. रतननाथ सरशार
2. औरत जात से : अज मुल्ला रमूजी
3. गफूर मियां से इफ्तेताब : तख्ल्लूस भोपाल
4. हिमाकते : शफीरकुर्रेहयान

तककीद :

1. मजमून अज शिब्लि मजस्माने शिब्लि
2. गालिब शख्सो शायर से : मंजूर गौरखपूरी
3. इकबाल की अजमत : आले अहमद सुरूर
4. चकबस्त बहैहियत पयोम्बरे दौरे जदीद : अहतेशाम हुसैन
5. कसीदे सिन्फे सूखुन की हैसियत से : ऊर्दू में कसीदा निगारी से डॉ. अबु मुहम्मद सहर

इकाईयां:

पहली इकाई : शामिले निसाब अफनाफ पर सवालात नं. 15
दुसरी इकाई : खत निमारों पर तनकीदी सवालात नं. 15
तीसरी इकाई : तन्जो मिजाह निगारों पर सवालात नं. 15
चौथी इकाई : तन्कीद निगारों पर सवालात नं. 15
पांचवी इकाई : शामिले निसाब खुतुत और तन्कीदी गमामी के इक्बेबासात की तशरीह नं. 15

निसाब उर्दू अदब
पर्चा– 2 (शामरी)
(पेपर कोड – 0200)
(मसनवियात ब – मन्जूमात)

नं. : 75

निसाब :

मसनवियात :

1. आदबी नामा : अज नजीर अकबर आबादी
2. बरसात की बहारे : अज नजीर अकबर आबादी
3. चुण की दाद : अज अल्ताफ हुसैन हाली
4. हुब्बे वतन : अज अल्लास हुसैन हाली
5. रामायण का एक सीन : अज बृजमोहन चकबस्त
6. जिब्रील और इब्लीस : डॉ. इकबाल
7. शुभाए उम्मीद : डॉ. इकबाल
8. अल्बेली सुबह : जोश मलीहाबादी
9. तन्हाई : फैज अहमद उल ईमान
10. आवारा : मजाज लखनवी
11. चांद तारो का बन : मखदमू मुहीउद्दीन
12. सुबहे परदा : सरदार जाफरी

इकाईयां :

इकाई

1. शामिले निसाब असनाफ पर सवालात नं. 15
2. मसनबी निगारो पर सवालात नं. 15
3. नज्म निगारों पर सवालात और मन्जूमात का खुलासा या जायजा नं. 15
4. तशरीह मजनवियात से नं. 15
5. तशरीह मन्ज्मात नं. 15

गृह विज्ञान

प्रश्न पत्र – 1

तंतु एवं वस्त्र विज्ञान

(पेपर कोड – 0191)

इस परीक्षा में दो प्रश्न पत्र होंगे । जिसमें से प्रत्येक तीन घंटे की अवधि तथा 50 अंकों का होगा। एक प्रायोगिक परीक्षा 50 अंकों की होगी। जिसमें से 10 अंक सत्रीय कार्य के लिये सुरक्षित रहेंगें। कुल अंक 150 होंगे। परीक्षार्थियों को लिखित एवं प्रायोगिक परीक्षा में पृथक–पृथक उत्तीर्ण होना अनिवार्य –

इकाई – 1 तन्तु विज्ञान का परिचय – तन्तुओं का वर्गीकरण, विशेषतायें, भौतिक एवं रासायनिक परीक्षण।

वस्त्र बुनाई (Weaver) : के प्रकार – सादी ट्विल सेटिन जैकार्ड, पाइल।

इकाई – 2 आधारभूत परिसज्जाऐं, विशेष पिसज्जाऐं । रंगों का वर्गीकरण एवं विभिन्न तंतुओं के लिये उनकी उपयुक्तता।

इकाई – 3 छपाई–प्रकार, ब्लाक, स्टेन्सिल, स्क्रीन, डिसचर्ज रोलर । प्रत्येक प्रकार की छपाई की विधियां । टाई एंड डाई–विशेषता, विधि।

इकाई– 4 धुलाई : जल, साबुन, शुष्क धुलाई, कलफ तथा नील । धब्बे छुड़ाना, विभिन्न प्रकार के वस्त्र धोना ।

इकाई – 5 परिधान – परिधान एवं व्यक्तित्व, परिधान का चुनाव, ड्राफ्टिंग की विधि, सीवर (प्रकार) परिधान में पूर्णता (डार्ट, प्लीट्स, टक्स, गेदर्स) प्लैक्ट ओपनिंग, फासनर।

स्वीकृत पुस्तकें –

1. वस्त्र विज्ञान एवं परिधान : छॉ. प्रमिला
2. वस्त्र विज्ञान के मूल सिद्धांत : डॉ. जी.पी. शैरी
3. हाउसहोल्ड फिसिक्स : डॉ. कुल श्रेष्ठ
4. गृह व्यवस्था एवं गृह सज्जा : श्रीमती के. बक्शी
5. गृह व्यवस्था एवं गृह सज्जा :चन्द्रकांता मांडलिक
6. गृह व्यवस्था एवं गृह कला : जी.पी. शैरी
7. गृह व्यवस्था एवं गृह कला : श्रीमति कांति पांडेय
8. पारिवारिक परिधान एवं व्यवस्था – मंजु पाटनी व सपना हेनरी
9. गृह व्यवस्था : छॉ. करूणा शर्मा

13/6/19 13/6/19 13.06.19

गृह विज्ञान
प्रश्न पत्र – 2
पारिवारिक संसाधन प्रबंधन

पूर्णांक – 50

(पेपर कोड – 0192)

इकाई – 1 गृह प्रबंध : गृह प्रबंध की परिभाषा, गृह प्रबंध प्रकिया, परिवार में गृहणी के कर्त्तव्य एंव उत्तरदायित्व – मूल्य, लक्ष्य स्तर–अर्थ विशेषता वर्गीकरण एवं विकाय, निर्णय प्रकिया।

इकाई –2 गृह सज्जा : कला के सिद्धांत एवं कला के तत्व । नमूना–रचनात्मक एवं अलंकारमय नमूना, नमूने के सिद्धांत।
रंग–रंग के महत्व एवं प्रभाव, फर्नीचर का चुनाव एवं महत्व, गृह सज्जा के उपसाधन । पुष्प सज्जा, प्रकार सिद्धांत, उपयोग।

इकाई – 3 पारिवारिक साधन : पारिवारिक साधन, वर्गीकरण, विशेषतायें, उपयोग को प्रभावित करने वाले तत्व, समय–अवधारणा, समय, व्यवस्थापन के साधन । समय व्यवस्थापन की प्रक्रिया ।
शक्ति– अवधारणा, विभिन्न घेरलू कार्यो में शक्ति व्यवस्थापन की प्रकिया ।
आय के साधन एवं प्रकार, पारिवारिक बजट, व्यय बचत, रहन सहन का स्तर , आय व्यय का लेखा जोखा (एकाउंट कीपिंग)

इकाई – 4 रसोई घर : आधुनिक रसोई घर, प्रकार, रसोई–घर के कार्यक्षेत्र, ईंधन के गैर परम्नरागत स्त्रोत, सौर ऊर्जा, जल वितरण प्रणाली, वायुबीजन, प्रकाश की व्यवस्था, संग्रह व्यवस्था।

इकाई – 5 कार्य का सरलीकरण – अर्थ, कार्य, विधियां एवं आदतों में सुधार की तकनीक, प्रोसेस चार्ट, पाथवे चार्ट, परिवर्तन की श्रेणियां । समय शक्ति एवं श्रम बचत के उपकरण।

प्रायोगिक कार्य :

1. सिलाई – ब्लाऊज, बेबी फ्राक, झबला, बाबा सूट, पंजाबी कुरता, सलवार, पेटीकोट, पुष्प सज्जा।
2. धुलाई– विभिन्न वस्त्रों की धुलाई, धब्बे छुडाना, बांधनी का कार्य ।
3. पुष्प सज्जा।

अंक वितरण –

सत्रीय : 10
सिलाई : 20
धुलाई : 15 (धुलाई कार्य, बांधनी – 10 , धब्बा छुड़ाना 5)
पुष्प सज्जा : 5

स्वीकृत पुस्तकें :

1. वस्त्र विज्ञान एवं परिधान	:	डॉ. प्रमिला
2. वस्त्र विज्ञान के मूल सिद्धांत	:	डॉ. जी.पी. शेरी
3. हाउसहोल्ड फिजिक्स	:	डॉ. कुलश्रेष्ठ
4. प्रारंभिक कृषि विज्ञान	:	राजेन्द्र प्रसाद
5. उद्यान विज्ञान	:	डॉ. एस.एस. श्रीवास्तव
6. गृह व्यवस्था एवं गृह सज्जा	:	श्रीमती के. बक्शी
7. गृह व्यवस्था एवं गृह सज्जा	:	चन्द्रकांता मांडलिक
8. गृह व्यवस्था एवं गृह कला	:	जी.पी. शैरी
9. गृह व्यवस्था एवं गृह कला	:	श्रीमति कांति पांडेय
10. कृषि विज्ञान	:	कृपाल सिंह भिंडर
11. उद्यान शास्त्र	:	बसंत इंगाले
12. पारिवारिक परिधान एवं व्यवस्था	:	मंजु पाटनी व सपना हेनरी।

13/6/19 Aschgal 13.06.19

DEFENCE-STUDIES
PAPER - I
WESTERN MILITARY HISTORY
(Paper Code-0214)

Note : The aim of this paper is to give a historical, political & social back ground of the state engaged in the conflicts under study and the factors influencing the development of different forms of warfare and weapons system.

Note : Question will be set from each unit there will be only Internal choice.

UNIT-I Age of Valour

1. Military System of Greek; Tactics of Phalanx.
2. Alexander the Great and his reforms.
3. Military system of Roman; Tactics of Legion, Jullius Caesar.
4. Battle of Arbela 311 B.C.
5. Battle of cannae 216 B.C.

UNIT-II Age of chivalry

1. Emergence and decline of cavalry.
2. Battle of Adrianopole 378 A.D.
3. Battle of Hastings 1066 A.D.
4. Cavalry tactics of Zenghiz Khan.
5. Battle of Cracee 1346 A.D.

UNIT-III Age of Gun Powder & Steam

1. Impact of Gun Powder in war.
2. Contribution of Gustavas adolphus & Fredrik the Great.
3. The Revolution in tactics - Causes of war of american Independence 1775-83.
4. The Revolution in tactics - Causes of French Revolution.
5. Nepoleanic art of warfare and his military reforms.

UNIT-IV World War - I & II

1. First World War - Causes of W.W., Policies and Strategic plans of the powers.
2. Role of Air Force with reference to theory of Douhet.
3. Role of Navy with reference of theory of Mahan.
4. Second World War - Causes of W.W., Objective and Strategy of Allied and Axis forces.
5. Personalities of Rommel.

UNIT-V World War - II

1. Armament and Mechanical warfare with reference to the theories of J.F.C. Fuller and Liddell Hart.
2. Role of air power, weapons, doctrines, tactics.
3. Role of naval power, weapons, doctrine tactics.
4. Tactics of Second World War.
5. Advent of Nuclear weapons and their impact on warfare.

SELECTED READING :

1. Harkabi Y. : Nuclear war and Nuclear peace
2. Earl E.M. : Makers of Modern strategy.

DEFENCE STUDIES

PAPER-II

THEORY AND PRACTICE OF WAR

(Paper Code-0215)

Aim : The aim of this paper it to acquaint the students with the concepts of theory and practice of war.

Note : Questions will be set from each unit and there will be only internal choice.

UNIT-I 1. Sunt Zu - Founderof MilitaryTheory and philosophy.
2. Clausewitz - War and its relationship with politics.
3. Macheavelli - Renaissance of Art of war.
4. Jomini- Concept of mass armies.

UNIT-II 1. Churchil.
2. Mahatma Gandhi.
3. Kautilya.
4. A. Hitler.

UNIT-III 1. Mao Tse Tung.
2. Che Guevara.
3. Economic and Psychological war.
4. Collective Security.

UNIT-IV 1. Indo-China War - 1962 Causes of war, political & military lesson.
2. Indo - Pak War - 1965 Causes of war, political & military lesson.
3. Indo - Pak War - 1971 Causes of war, political & military lesson.
4. Kargil Conflict.

UNIT-V 1. Internal & External threats of National Security.
2. Insurgency and Counter-Insurgency.
3. Terrorism-Problem and Solution.
4. Naxalism - Problem and solution.

REFRENCE BOOKS :

1. Howard M. : Theory and Practice of war
2. ---,,--- : Clausewitz
3. Mao Tse Tung : Guerilla war fare
4. Palit, D.k. : The lightning War Tadit Yudh
5. Mankekar : War of 1971
6. आर .सी. जाहरी : पाश्चात्य सैम्य विचारक
7. शर्मा व निगम : सैम्य विचारक

DEFENCE STUDIES

PRACTICAL

There shall be a practical examination of 3.5 hours duration carrying 50 Marks. The division of marks shall be as follow :

(a) Exercise based on Map-reading	:	15 marks
(b) T.W.E.S.T.	:	15 marks
(c) Sessional work	:	10 marks
(d) Viva-Voce	:	10 markss

PART - A

Map-reading :

1. Scales - Definition, method of expressing, construction of simple, time, diagonal and comparative.
2. Relief and its representation.
3. Slopes and Gradient.
4. Visibility and inter-visibility by Gradient, proportionate and section method.
5. Re-section and inter-section.
6. Grid system-Map reference, Indexto map. Four figure and Six figure.

PART - B

7. Organisation and equipment of infantry Platoon and Section.
8. Section Formation.
9. Indication of Target by various methods.
10. Fire control order.
11. Patrols.
12. Battle Procedures (ROFT).
13. Verbal Order.
14. Message-Writing.

BOOKS RECOMMENDED:

1- Manual of Map Reading : London Her
2- युद्ध स्थल कला : चौ. नरेन्द्र सिंह
3- एन. सी. सी. परिचय – विष्णु कान्त शर्मा

MANAGEMENT

PAPER - I

MANAGEMENT STUDIES : PERSONNEL MANAGEMENT

(Paper Code-0206)

Max. Marks: 75

UNIT-I Evolution of the personnel function:

1. Various concepts oflabour.
2. Old and new definitions of personnel management.
3. Development of personnel management inIndia.
4. Organisation &function of the personnel division.
5. Personnel Management as a co-ordinating function.
6. F Personnel Policies.

UNIT –II Procurement :

1. Job analysis &Man power requirments.
2. Recruitment and Hiring.
3. Test andinterviews.
4. Executive manpower planning.

UNIT - III Development:

1. Training operativePersonnel
2. ExecutiveDevelopment.
3. Advancement through promotion
4. Performance appraisal.

UNIT - IV Compensation:

1. Base compensation for the job.
2. Incentive compensation for the man.
3. Supplimentary Compensation for the group.

UNIT - V Integration:

1. Man in business organisation.
2. Motivation.
3. Man inconflict.
4. Humanrelations.
5. Collective bargaining.

UNIT - VI Maintenance:

1. Safety andHealth.
2. Employees serviceprogramme.
3. Personnel research.

BOOKS RECOMMENDED:

1.	Scott. Clothier&Spriegal	:	Personnel Management
2.	Pigores&Myers	:	Personnel Administration
3.	YoderDale	:	Personnel Management and IndustrialRelations
4.	Flippo,Edwin	:	Principles of Management
5.	Maroria, C.B.	:	Personnel Management
6.	Ahuja,K.K.	:	Personnel Management
7.	Dayat	:	Management Training Organisation.
8.	Dinesh,K.N.	:	Structure of Medium Scale Industries inBhilai.

MANAGEMENT
PAPER - II
STATISTICS Max. Marks : 75
(Paper Code-0207)

UNIT-I Meaning definition, origin and growth of statistics importance, limitations and function of statistics collectionof data primary data and methods of collections samples and its types.

UNIT-II Measure central tendency, mean, Median,mode, Quartiles, Deciles and Percentiles, Merits & Demerits of different measures, Methods of calculation.

UNIT-III Measures of dispersion- Mean deviation standard deviation its merits and demerits Methods of calculation. Coefficient of variation.

UNIT-IV Correlation : Meaning, Kari Pearson's Coefficient of correlation, Direct and shortcut methods of calculation. Regression Equation & its Co-effcient.

UNIT-V Index numbers and growth of statistics, Types of Index numbers and construction of index numbers. Population Statistics Statistical agencies central & state agencies, National sample survey.

BOOKS RECOMMENDED:

1	Ethance	:	Fundamental ofStatistics.
2	S.P.Gupta	:	Statistics
3	K.C. Nagar	:	सांख्यिकी के मूल तत्व
4	Shukla&Sahani	:	सांख्यिकी

EDUCATION

There shall be two theory paper, each carrying 60 marks and Three hours duration and Viva-voce examination of 30 marks. The Viva-voce examination will be based on two theory papers. It will be for both regular and private candidtes. There will be an internal choice in question.

INSURANCE PRINCIPLES & PRACTICE

PAPER- I

FIRE AND MARINE INSURANC M.M. : 50

(Paper Code-0193)

UNIT -I FIRE INSURANCE CONTRACT:

Origin of fire insurance its nature, risks, hazards and indemnity; Legal basis; Stipulation and conditions; contracts; Full disclosure of material facts; Inspection and termination of coverge.

UNIT -II FIRE INSURANCE POLICIES :

Issue and renewal of policies; Different kinds; Risks covered; recovery of claims-insurer's option : Ex-gratia payment and subrogation. policy conditions; Hazards not covered, contribution and average; Reinsurance. double insurance and excess insurance. Types of fire protection policies issued by the General Insurance corporation of India.

UNIT -III MARINE INSURANCE CONTRACT :

Origin and growth; History of lloyds; Evaluation of Marine insurance business in India. Basic elements Insurable interest Utomost Good Faith Implied warranties: Policy document.

UNIT-IV Types of marine insurance contract-freight, Cargo and vessel. Procedure for obtaining marine protection policy; Marine policies and conditions. Nature of coastal marine insurance; Perils covered, protection avlable; Procedure for preparation, and presentation of claim; Payment of campensation by insurer.

UNIT -V MARINE LOSSES

Total loss, Partial loss, particular average loss and general average loss; Preparation of loss statement, Payment of Marine losses-reguirement of the insured documents needed procedure for presentation of claim; Valuation of loss salvage; limits of liability; Attachment and termination of risk.

INSURANCE PRINCIPLES & PRACTICE

PAPER - II

INSURANCE FINANCE & LEGISLATION

(Paper Code-0194)

UNIT - I INTRODUCTION :

Laws of probability; Forecast of future events; Construction of mortality tables; Mortality tables for annuities.

UNIT - II PREMIUM DETERMINATION :

Basic factors; Use of mortality tables in premium determination; Interest, compound interest functions. Net and gross premiun: Mode and perlodicity of premium payment; Mode of claim payment; benefits to be provided; Mode of loadingfor expenses.

UNIT - III Gross premium-general considerations, insurer's expenses; Margin adjusting;

Premium for term insurance; Temporary insurance; Endowment insurance; Level and natural premium plan; Premium calculation for study of actuarial valuation.

UNIT - IV RESERVES ANS SURPLUS :

Nature, origin and importance of reserves and funds in life and property insurance. Retrospective and prospective reserve Computation. Statutory regulationof re-serves. Nature of surrender value; concept and calculation of surrend value, reduced paid up values; Settlement options; Autometice premium loan. Nature and Sources of insurance surplus; special form of surplus; Distribution of surpluses-extra dividend, residuary dividend; Investments of surplus and reserves-basic principles.
Investment policy of L.I.C. and GIC in India.

UNIT - V LEGISLATIN :

A-Brief study of indian Insurance Act, 1938.

Detailoed stydy of Life Insurance Corporation of India.

Act, 1956,General Insurance Corporation of India.

Act,1976 , Export Credit and Guarantee corporation Act.

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FUNCTIONAL ENGLISH

PAPER - I **Mark: 50**

(Paper Code-0208)

UNIT - I	(i)	Nouns, Gender, Number,	15
	(ii)	Modal Velus and Auxilaries.	
	(iii)	Synonyms and Antonyms	
UNIT - II	(i)	Active and Passive Voice.	15
	(ii)	Direct and Indirect Speech.	
	(iii)	Sentence Connecters.	
UNIT - III	(i)	Transformation of Sentences	10
	(ii)	Errors in Individuala Sentences.	
UNIT - IV	(i)	Isions and phrases.	
	(ii)	Use of Foreign words in english.	

FUNCTIONAL ENGLISH

PAPER - II **Mark:50**

(Paper Code-0209)

(i) Precis writing

(i) Report writing

(i) Expansion of Ideas.

(iv) Drafting Telegrames.

(v) Letter-Writing (Personal,Business,General)

(vi) English in Situations :-

(a) Greetings.	(b) Buying a Dress.
(c) Making a Telephone call.	(d) In the Post office.
(e) At the Doctors	(f) At the Restaurant.
(g) At the Chemist.	(h) Booking a room At a Hotel.
(i) At the Airport.	(j) At the Bank
(k) At the Book Shop.	(l) In the Library.
(m) Receving and Seeing off a Guest.	

Dr. M. Chakraborty — Dr. S. Gupta — DR. MERILY ROY

B.A. II nd Year

HISTORY OF INDIAN PAINTING

Marks : 50

(Paper Code-0219)

SESSION – 2019-20

(1) The time of theory paper is three hours.

pre-historic to Middle age.

* **Pre-Historic Painting** :
  - Mirjapur - (U.P.)
  - Shinghanpur - (M.P.)
  - Housangabad - (M.P.)
  - Vimbatka - (M.P.)
* **Proto Historic Painting :**
  - Jogimara
  - Bagha
  - Ajanta
* **Middle age : Rajthani Painting -**
  - Mewad Style Kishan garh Bundi
  - Mugal Painting
  - Akbar
  - Jahangir
  - Sahajahan
* **Pahadi Painting :**
  - Basholi
  - Kangda
  - Chamba

LIST OF THE BOOK RECOMENDED FOR THEORY :

*	Bharatiya Kala Ka Itihas	:	Shayam Bihari Aggrawal
*	Bharatiya Chitra Kala Ka Vikas	:	C.L.Jha
*	Kala Vilas	:	R.A.Aggrawal

PRACTICAL

There will be two practical paper evalution will be made by the external and the internal examiner. Together and sessional marking is made by the class Teacher.

The time of each paper is four hour's and there will be a half hour's recess in between.

14/06/19

PORTRAIT FROM HEAD
PAPER – I
SESSION – 2019-20

Scheme of Examination.
Time - Four Hour's
Size - 1/2 Imp. paper
Medium - Pencil or pastal

Total Mark - 50
Examination-40
Sessional - 10

Class work- Minimum work to be submited Five painting size 1/2 Imp Paper portait from plaster or cement head will be drown with light and shedow.

COMPOSITION
PAPER – II

Scheme of Examination	Total Mark -	50
Time - Four hour's	Examination -	40
Size - 1/4 Imp Paper	Sessional-	10
Medium - Poster colour		

Class work-

Minimum work to be submited. Five painting size 1/4 Imp.

Composition-

Minimum two human figure and Meximum four human figure will be composed.

----0----

14/06/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

संशोधित पाठ्यक्रम – बी.ए. द्वितीय वर्ष के अंतर्गत

सत्र 2019 – 20

विषय – नृत्य (भरत नाट्यम)

बी.ए. भाग (2) के लिये इस विषय में प्रायोगिक और सैद्धांतिक दो भाग होगें। प्रायोगिक 50 अंक एवं सैद्धांतिक 100 अंक का होगा। इस हेतु 50–50 अंक के दो प्रश्नपत्र होंगे। प्रत्येक वर्ष के पूर्णांक कुल मिलाकर 150 अंक के होगें।

क्र	विवरण		पूर्णांक	उत्तीर्णांक
1	सैद्धांतिक प्रथम प्रश्न पत्र	–	50	17
2	सैद्धांतिक द्वितीय प्रश्न पत्र	–	50	17
3	प्रायोगिक	–	50	17
		योग	**150**	**51**

सैद्धांतिक (विस्तृत पाठ्यक्रम)

सत्र 2019 – 20

प्रथम प्रश्न पत्र

शीर्षक – नृत्य का इतिहास एवं सामान्य जानकारी

(पेपर कोड – 0220)

1. **नृत्य का इतिहास** (पाणिनी काल से गुप्त काल तक नृत्य का इतिहास) – 1. जैन एवं बौद्ध अभ्युद्य काल 2. पूर्व मध्यकाल 3. शुंग एवं कनिष्क काल 4. गुप्तकाल
2. **अभिनयभेद** – आंगिक, वाचिक, आहार्य एवं सात्विक
3. **विभिन्न शास्त्रीय नृत्य प्रणालियाँ (संक्षिप्त परिचय)** – 1. भरत नाट्यम 2. कथक 3. कथकलि 4. ओडिसी
4. **संगीत की व्याख्या और नृत्य का उसमें स्थान**
5. **लोकधर्मी नाट्य परंपरा** संक्षिप्त जानकारी – **लोकनाट्य**
   1. जात्रा 2. तमाशा
   3. कीर्तनिया 4. डांडिया रास

   लोक नृत्य – गरबा, सरहुल

14/06/19 14/06/19 14/06/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

सैद्धांतिक (विस्तृत पाठ्यक्रम)

सत्र 2019 – 20

द्वितीय प्रश्न पत्र

शीर्षक – शास्त्रीय नृत्य सिद्धान्त

(पेपर कोड – 0221)

1. **दक्षिण भारतीय ताल पद्धति**
2. **संक्षिप्त टिप्पणियाँ** – 1. मंगलाचरण 2. पुष्पांजलि 3. नाट्य 4. नृत्त 5. नृत्य
3. **नृत्य कलाकार के आवश्यक गुण एवं दोष**
4. **भरतनाट्यम पद्धति के क्रमों (मार्गम का संक्षिप्त विवरण)**
   1. अलारिपु 2. जतिस्वरम् 3. शब्दम् 4. अष्टपदी 5. पदम्
5. **वरिष्ठ नृत्य कलाकार की संक्षिप्त जीवनी**
   1. श्रीमती गौरी अम्मा 2. श्री मीनाक्षी सुंदरम् पिल्लई

<u>प्रायोगिक</u>

1. **मौखिक मुद्रा प्रदर्शन –**
   (1) असंयुक्त हस्त की प्रथम पंद्रह मुद्राओं (पताक से पद्मकोष तक) का विनियोग (श्लोक सहित)
   (2) देव हस्त, (3) बंधु – बांधव हस्त

2. **कार्यक्रम विभाग**
   (1) शारीरिक अभ्यास
   (2) दस अड़तु (अंगसंचालन चार काल में)
   (3) जतिस्तरम्
   (4) शब्दम् या श्लोकम्

14/06/19 14/06/19 14/06/19

दुर्ग विश्वविद्यालय, दुर्ग (छ.ग.)

पाठ्यक्रम

परीक्षा – 2017–18

बी.ए. भाग–3

B.A. Part-III

B.A./B.A. (CLASSICS) PART-III

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REVISED ORDINANCE NO.11

(As per State U.G.C. Scheme)

BACHELOR OF ARTS

1. The three year course have been broken up in to three Parts.

   Part-I Examination : at the end of the first year.
   Part-II Examination : at the end of the second year and
   Part-III Examination : at the end of the third year.

2. A candidate who after passing (10-2) or intermediate examination of C.G. Board of Secondary Education, Raipur or any other examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.A. Part-I examination.

3. A candidate who after passing B.A. Part-I examination of the University or any other examination recognised by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part II Examination.

4. A candidate who after passing B.A. Part II examination of the University has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate candidates shall be eligible for admission to the examination as per provisions of Ordinance N. 6 relating to Examinations (General). Provided that non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular students at any of the University Teaching Department or College.

6. Every candidate for the Bachelor of Arts examination shall be examined in : A. Foundation Course :

   i) Group B - Hindi Language
   ii) Group C - English Language

   B. Three Core subjects : One subject from any three groups out of the following six groups :

      1. Sociology/Ancient Indian History/An thropology.
      2. Political Science/Home Science/Vocational Course.

3. Hindi Literature/Sanskrit Literature/Urdu Literature/Math.
4. Economics/Music/Linguistics/Defence studies.
5. Philosophy/Psychology/Geography/Education/Management.
6. History/English Litrature/Statistics.
7. Practicals (if necessary) for each core subject.

7. Any candidate who has passed the B.A. examination of the University shall be allowed to present himself for examination in any of additional subjects prescribed for the B.A. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.A. Part I examination in the subject which he proposes to offer and then the B.A. Part II and Part III examination in the same subject. Successfull candidate will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total makrs in each subject/group of subjects. In subject/group of subjects, where both theory and practical examination are provided, an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part II and part-III examination. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the divison of the Final examination, total marks obtained by the examinees, in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part I Examination.

   Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject only the total aggregate marks being carried over for determining the division shall include the actual marks obtained in the subject in which he appeared at the supplementary examination.

10. Successful exminees at the Part-III examination obtaining 60% or more marks shall be placed in the First division, those obtaining less than 60% but not less than 45% marks in the Second division and other successful examinees in the third division.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks		Min. Marks
A.	**Compulsory Subject - Foundation Course :**				
	Hindi Language	I	75		26
	English Language	**I**	75		26
B.	**Three Core Subject :**				
1.	Hindi Literature	I	75		
		II	75	150	50
2.	Sanskrit Literature	I	75		
		II	75	150	50
3.	English Literature	I	75		
		II	75	150	50
4.	Philosophy	I	75		
		II	75	150	50
5.	Economics	I	75		
		II	75	150	50
6.	Political Science	I	75		
		II	75	150	50
7.	History	I	75		
		II	75	150	50
8.	Ancient Indian History	I	50		
	Culture & Archaeology	II	50	100	50
			Practical	50	17
9.	Sociology	I	75		
		II	75	150	50
10.	Geography	I	50		
		II	50	100	50
			Practical	50	17
11.	Mathematics	I	50		
		II	50	150	50
		III	50		
12.	Statistics	I	50		
		II	50	100	33
			Practical	50	17

	Subject	Paper		Max. Marks	Min. Marks
13.	Anthropology	I	50	100	33
		II	50		
			Practical	50	17
14.	Linguistics	I	75	150	50
		II	75		
15.	Indian Music	I	50	100	33
		II	50		
			Practical	50	17
16.	Home Science	I	50	100	33
		II	50		
			Practical	50	17
17.	Education	I	75	150	50
		II	75		
18.	Psychology	I	50	100	33
		II	50		
			Practical	50	17
19.	Management	I	75	150	50
		II	75		
20.	Defence Studies	I	50	100	33
		II	50		
			Practical	50	17
21.	Urdu	I	75	150	50
		II	75		

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986-

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the university or examination centres.
3. Calculators with, memory and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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हिन्दी भाषा
(पेपर कोड–0231)
प्रथम प्रश्न पत्र पूर्णांक – 75

(बी.ए., बी.एस.सी., बी.एच.एस.सी., बी.काम., तृतीय वर्ष के पुनरीक्षिण एकीकृत आधार पाठ्यक्रम एवं पाठ्य सामग्री का संयोजन 2000–2001 से लागू है)

।। सम्प्रेषण कौशल, हिन्दी भाषा और सामान्य ज्ञान ।।

आधार पाठ्यक्रम की संरचना और अनिवार्य पाठ्य पुस्तक–हिन्दी भाषा एवं समसामयिकी– का संयोजन इस तरह किया गया है कि सामान्य ज्ञान की विषय वस्तु– विकासशील देशों की समस्याओं– के माध्यम, आधार और साथ–साथ हिन्दी भाषा का ज्ञान और उसमें सम्प्रेषण कौशल अर्जित किया जा सके । इसी प्रयोजन से व्याकरण की अन्तर्वस्तु को विविध विधाओं की संकलित रचनाओं और सामान्य ज्ञान की पाठ्य सामग्री के साथ अन्तगुर्स्फित किया गया है । अध्ययन–अध्यापन के लिए पूरी पुस्तक की पाठ्य सामग्री है और अभ्यास के लिये विस्तृत प्रश्नावली है। यह प्रश्नपत्र भाषा का है अतः पाठ्य सामग्री कर व्याख्यात्मक या आलोचनात्मक अध्ययन अपेक्षित नहीं है । पाठ्यक्रम अरैर पाठ्य सामग्री का संयोजन निम्नलिखित पांच इकाइयों में किया जाता है । प्रत्येक इकाई दो भागों में विभक्त किया गया है ।

इकाई –1 (क) भारत माता : सुमित्रानंदन पंत, परशुराम की प्रतीज्ञा : रामधारी सिंह दिनकर, बहुत बड़ा सवाल : मोहन राकेश, संस्कृति और राष्ट्रीय एकीकरण : योगेश अटल

(ख) कथन की शैलियां : रचनागत उदाहरण और प्रयोग ।

इकाई –2 (क) विकासशील देशों की समस्यायें, विकासात्मक पुनर्विचार, और प्रोद्योगिकी एवं नगरीकरण ।

(ख) विभिन्न संरचनाएं।

इकाई–3 (क) आधुनिक तकनीकी सभ्यता, पर्यावरण प्रदूषण तथा धारणीय विकास।

(ख) कार्यालयीन पत्र और आलेख ।

इकाई–4 (क) जनसंख्या : भारत के संदर्भ में और गरीबी तथा बेरोजगारी।

(ख) अनुवाद।

इकाई–5 (क) ऊर्जा अरैर शक्तिमानता का अर्थशास्त्र ।

(ख) घटनाओं, समारोहो आदि का प्रतिवेदलन और विभिन्न प्रकार के निमंत्रण–पत्र।

मूल्यांक योजना : प्रत्येक इकाई से एक–एक प्रश्न पूछा जायेगा । प्रत्येक प्रश्न में आंतरिक विकल्प होगा । प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई दो–दो खण्ड (क्रमशः 'क' और 'ख' में) विभक्त है, इसलिए प्रत्येक प्रश्न के भी दो भाग, (क्रमशः 'क' और 'ख' में) होगें । 'क' अर्थात पाठ एवं सामान्य ज्ञान से संबंद्ध प्रश्न के अंक 8 एवं 'ख' अर्थात भाषा एवं समप्रेषण कौशल से संबद्ध प्रश्न के अंक 7 होगें । इस प्रकार पूरे प्रश्न के पूर्णांक 75 होंगे ।

PART - II

ENGLISH LANGUAGE M.M. 75

(Paper Code-0232)

The question paper for B.A./B.Sc./B.Com./B.H.Sc. III Foundation course, English Language and General Answers shall comprise the following items :

Five question to be attempted, each carrying 3 marks.

UNIT-I	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	15
UNIT-II	Essay writing	10
UNIT-III	Precis writing	10
UNIT-IV	(a) Reading comprehension of an unseen passage	05
	(b) Vocabulary based on text	10
UNIT-V	Grammar Advanced Exercises	25

Note : Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women and Worm in Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, the question of human social value, new Economic Philosophy Recent Diberaliation Method) Demoration docontralisation (with reference to 73, 74 constitutional Amendment.

Books Prescribed :

Aspects of English Language And Development - Published by M.P. Hindi Granth Academy, Bhopal.

– – – – – – – –

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

हिन्दी साहित्य
प्रथम प्रश्न पत्र
जनपदीय भाषा–साहित्य (छत्तीसगढ़ी)
(पेपर कोड 0233)

प्रस्तावना–

हिन्दी केवल खड़ी बोली नही है, बल्कि एक बहुत बड़ा भाषिक समूह है । हिन्दी जगत में अनेक विभाषाएं बोलियां और उपबोलियां विद्यामान है जिनमें पुष्कल साहित्य सम्प्रदा है। इनके सम्सक अध्ययन और अन्वेषण की आवश्यकता है। जनपदीय भाषा छत्तीसगढ़ी निरन्तर विका की ओर अग्रसर हो रही है । अस्तु, इस भाषा और इसमें रचित साहित्य का इतिहास–विकास स्पष्ट करतक हुए इनसे संबंधित प्रमुख रचनाकारों का आलोचनात्क अनुशीलन करना हिन्दी के वृहत्तर हित में होगा । छत्तीसगढ़ी भाषा का पाठ्यक्रम निम्न बिन्दुओं पर आधारित है–

(क) छत्तीसगढ़ी भाषा का इतिहास – विकास।
(ख) छत्तीसगढ़ी भाषा में रचित साहित्य का इतिहास।
(ग) छत्तीसगढ़ी भाषा के प्रमुख प्राचीन एवं अर्वाचीन रचनाओं की कृतियों का अध्ययन।

पाठ्य विषय–

रचनाएं–

(1) प्राचीन कवि संत धर्मदास के 3 पद
1. गुरू पइंया लागों नाम लखा दीजो हो ।
2. नैन आगे ख्याल घनेरा ।
3. भजन करौ भाई रे, अइसन तन पाय के ।
(सदंर्भ– धर्मदास के शब्दावली से उदधृत)

(2) लखनलाल गुप्त का गद्य–
1. सेनपान
(गद्य– पुस्तक ''सोनपान'' के उद्धृत)

(3) अर्वाचीन रचनाकार
डॉ. सत्यभामा आडिल रचित गद्य
1. सीख सीख के गोठ
(गद्य– पुस्तक '' गोठ '' के उद्धृत)

(4) डॉ. विनय पाठक की कविताएं–
1. तंय उठथस सुरूज उथे
2. एक किसिम के नियाव
('' अकादसी और अनचिन्हार'' पुस्तक से उद्धृत)

(5) मुकुन्द कौशल– छत्तीसगढ़ गजल

'' छै बित्ता के मनखे देखों ..... से –मछरी मन लाख लेथे'' तक
(पुस्तक '' छत्तीसगढ़ गजल'' के पृष्ट 17 से उद्धृत)

द्रुतपाठ के रचनाकार – (व्यक्तित्व एवं कृतित्व)

1. सुन्दर लाल शर्मा
2. कविलनाथ कश्यप
3. रामचन्द्र देशमुख (रंगकर्मी)

अंक विभाजन

3 व्याख्याएं	–	21 अंक
2 आलोचनात्मक प्रश्न	–	24 अंक
5 लघुत्तरी प्रश्न	–	15 अंक
15 वस्तुनिष्ठ/अति लघुत्तरी प्रश्न	–	15 अंक
कुल	**–**	**75 अंक**

इकाई विभाजन

इकाई एक	–	व्याख्या
इकाई दो	–	प्राचीन एवं अर्वाचीन रचनाकार
इकाई तीन	–	(अ) छत्तीसगढ़ भाषा का इतिहास (ब) छत्तीसगढ़ साहित्य का इतिहास
इकाई चार	–	द्रुतपाठ के तीन रचनाकार
इकाई पांच	–	वस्तुनिष्ट/ अतिलघूत्तरीय प्रश्न (सम्पूर्ण पाठ्यक्रम से)

द्वितीय प्रश्न पत्र
हिन्दी भाषा–साहित्य का इतिहास तथा काव्यांग विवेचन
(पेपर कोड – 0234)

प्रस्तावना–

हिन्दी भाषा का इतिहास जितना प्राचीन है, उतना ही गुढ़–गहन भी । इसमें रचित साहित्य ने लगभग डेढ़ हजार वर्षो का इतिहास पूरा कर लिया है । इसलिए हिन्दी भाषा और साहित्य के ऐतिहासिक विवेचन की बड़ी आवश्यकता है । इसी के साथ–साथ हिन्दी ने अपना जो स्वतंत्र साहित्य शास्त्र निर्मित किया है, उसे भी रूपायित करने की आवश्यकता है । इसके संज्ञान द्वारा विद्यार्थी की मर्मग्राहिणी प्रतिभा का विकास होगा और ऐतिहासिक परिप्रेक्ष्य में शुद्ध साहित्यिक विवेक का सन्निवेश होगा।

पाठ्य विषय–

(क) हिन्दी भाषा का स्वरूप विकास – हिन्दी कर उत्पत्ति, हिन्दी की मूल आकर भाषाएं तथा विभिन्न विभाषाओं का विकास । हिन्दी भाषा के विभिन्न रूप–

1. बोलचाल की भाषा
2. रचनात्मक भाषा
3. राष्ट्रभाषा
4. राजभाषा
5. सम्पर्क भाषा
6. संचार भाषा

हिन्दी का शब्द भण्डार – तत्सम, तद्भव, देशज, आगत शब्दावली।

(ख) हिन्दी साहित्य का इतिहास :– आदिकाल, पूर्व मध्यकाल, उत्तर मध्यकाल और आधुनिक काल की सामाजिक, सांस्कृतिक पृष्ठभूमि, प्रमुख युग प्रवृत्तियां, विशिष्ट रचनाकार और उनकी प्रतिनिधि कृतियां, साहित्यिक विशेषताएं।

(ग) काव्यांग – काव्य का स्वरूप एवं प्रयोजन।
रस के विभिन्न भेद, विभिन्न अंगह, विभावादि तथा उदाहरण।

प्रमुख 5 छंद– दोहा, सोरठा, चौपाई, कुण्डलियां, सवैया।

शब्दालंकार– अनुप्रास, यमक, श्लेष, वक्रोक्ति, पुनरूक्ति प्रकाश।

अर्थालंकार– उपमा, रूपक, उत्प्रेक्षा, अतिश्योक्ति, भ्रांतिमान।

संदर्भ ग्रंथ – (1) हिन्दी साहित्य का इतिहास
संपादक – डॉ. सुशील त्रिवेदी व बाबूलाल शुक्ल। (प्रकाशक – म.प्र. उ.शि. अनुदान आयोग)
(2) राजभाषा हिन्दी – मलिक मोहम्मद (प्रभात प्रकाशन दिल्ली)
(3) हिन्दी भाषा – डॉ. भोलानाथ तिवारी।

अंक विभाजन–

4 आलोचनात्मक प्रश्न	–	44 अंक
4 लघुउत्तरीय प्रश्न	–	16 अंक
15 वस्तुनिष्ट प्रश्न	–	15 अंक
कुल अंक	**–**	**75 अंक**

इकाई विभाजन–

इकाई – 1 **हिन्दी भाषा का स्वरूप – विकास– (खण्ड–'क')**
इकाई – 2 **हिन्दी का शब्द भण्डार (खण्ड–'क' का अंतिम भाग)**
इकाई – 3 **हिन्दी साहित्य का इतिहास (खण्ड–'ख')**
इकाई – 4 **काव्यांग – रस, छंद, अलंकार (खण्ड–'ग')**
इकाई – 5 **लघुउत्तरीय एवं वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)**

प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्व
प्रथम प्रश्न पत्र
भारतीय वास्तु तथा कला के मूल तत्व

(पेपर कोड – 0266) पूर्णांक – 50

इकाई –1 हड़प्पा कालीन वास्तु, मौर्य कालीन वास्तु (सांची, भरहुत तथा अमरावती), पश्चिमी भारत के चैत्यगृह तथा विहार– भाजा, कार्ले, कोण्डाने, अंजता और एलोरा।

इकाई –2 मंदिर वास्तु – गुप्तकालीन मंदिर, चंदेल कालीन, चालुक्य, पल्लव, कलचुरि मंदिर।

इकाई –3 मूर्तिकला – हड़प्पा कालीन, मौर्यकालिन, शुंगकालीन, कुषाण कालीन (गांधार एवं मथुरा)

इकाई –4 गुप्तकालीन मूर्तिकला, कलचुरि मुर्तिकला।

इकाई –5 प्रागैतिहासिक चित्रकला, अंजता और बाघ की चित्रकला, सिंघनपुर की चित्रकला, काबरा पहाड़।

अनुशंशित ग्रंथ–

1.	वासुदेव शरण अग्रवाल	–	भारतीय कला भाग–1
2.	रामनाथ मिश्र	–	भारतीय मूर्तिकला
3.	कृष्णदत्त बाजपेयी	–	भारतीय वास्तुकला का इतिहास
4.	वासुदेव उपाध्याय	–	प्राचीन भारतीय स्तुप, गुहा एवं मंदिर
5.	कृष्णदत्त बाजपेयी एवं संतोष कुमार बाजपेयी	–	भारतीय कला
6.	सच्चिदानंद सहाय	–	मंदिर स्थापत्य का इतिहास
7.	जयनारायण पांडेय	–	भारतीय कला
8.	मारूतिनंदन प्रसाद तिवारी तथा कमल गिरी	–	भारतीय प्रतीमा विज्ञान
9.	ए.एल. श्रीवास्तव	–	भारतीय कला
10.	A.K. Coomarswami	–	History of Indian and Indonesion Art
11.	Percy Brown	–	Indian Architecture. Vol. –I
12.	Krishnadeva	–	Temples of north India
13.	S. Kramrisch	–	Hindu Temples Part I & II

20/7/17

द्वितीय प्रश्न पत्र
(अ) भारतीय पुरातत्व के मूलतत्व
(पेपर कोड–0267) पूर्णांक – 50

इकाई–1 पुरातत्व विज्ञान की परिभाषा, विस्तार क्षेत्र, अध्ययन की अन्य शाखाओं से सन्बन्ध।

इकाई–2 भारत में पुंरातत्व का इतिहास, प्राचीन स्थलों की खोज, तिथि निर्धारण ।

इकाई–3 उत्खनन–विधियां, सर्वेक्षण स्तर विन्यास, उत्खनन का लेखा–जोखा।

इकाई–4 भृदभाण्ड, गैरिक भृदभाण्ड, चित्रित धूसर भृदभाण्ड, काले और लाल भृदभाण्ड, उत्तरी कृष्ण मार्जित भृदभाण्ड (एन.वी.पी.)।

इकाई–5 प्रमुख पुरास्थलों का अध्ययन –
कालीबंगा, एरण, कौशाम्बी, हास्तिनापुर, ब्रह्मगिरी, सिरपुर, मल्हार।

अनुशंशित ग्रंथ–

1. के. डी. बाजपेयी – मध्यप्रदेश का पुरातत्व
2. आर. एम. व्हीलर – पृथ्वी से पुरातत्व
3. बी.एन. पुरी – पुरातत्व विज्ञान
4. जयनारायण पाण्डये – पुरातत्व विमर्श
5. राकेश प्रकाश पाण्डेय – पुरातत्व विज्ञान
6. मदन मोहन सिंह – पुरातत्व की रूपरेखा

2017/17

''अथवा''

द्वितीय प्रश्न पत्र
(ब)पुराभिलेख एवं मुद्राशास्त्र के मूल तत्व
(पेपर कोड – 0268)

पूर्णांक– 50

इकाई–1

1. प्राचीन भारतीय इतिहास की पुनर्रचना में अभिलेखों कर महत्व ।
2. लेखन कला का उद्‌भव एवं विकास।
3. अभिलेखों में प्रयुक्त भाषायें, लितियां तथा सामाग्री।

इकाई–2 निम्नलिखित अभिलेखों का ऐतिहासिक महत्वः

1. अशोक का द्वितीय शिलालेख।
2. अशोक का बारहवां शिलालेख।
3. हेलियोडोरस का बेसनगर स्तम्भलेख।
4. रूद्रदामन की प्रयाग प्रशस्ति।
5. समुद्रगुप्त की प्रयाग प्रशस्ति ।
6. पुलकेशिन द्वितीय का ऐहोल अभिलेख।

इकाई– 3

1. इतिहास की पुनर्रचना में मुद्रा का महत्व
2. मुद्रा का उद्‌भव तथा प्राचीनता।
3. आहत सिक्के।

इकाई– 4 जनपदीस सिक्केः तक्षशीला, कौशम्बी, एरण, कोसल, जनपद के सिक्के।

इकाई– 5 गुप्त सिक्के, महेन्द्रादितय कमादित्य प्रकार के सिक्के, (छत्तीसगढ़ अंचल से प्राप्त), नल नरेशों के सिक्के।

अनुशंशित ग्रंथ–

1. डी.सी. सरकार – इंडियन एनिग्राफी
2. डी.सी. सरकार – सेलेक्ट इन्सक्रिप्शन्स भाग 1 व 2
3. एस. एच. दानी – इंडियन पैलियोग्राफी
4. वसुदेव उपाध्याय – प्राचीन भारतीय अभिलेखों का अध्यय
5. कृष्णदत्त बाजपेयी, कन्हैयालाल अग्रवाल, संतोष कुमार बाजपेयी – ऐतिहासिक भारतीय अभिलेख
6. परमेशवरी लाल गुप्ता – प्राचीन भारतीय मुद्राएं
7. डी. सी. सरकार – स्टडीज एवं इंडियन क्वाएन्स
8. ए.के. शरण – ट्राइबल क्वाएन्स
9. भास्कर चट्‌टोपाध्याय – द एज ऑफ दि कुषाणाजः ए न्यूमिस्मेटिक स्टडी
10. ए.एस. अल्तेकर – गुप्तकालीन मुद्राएं
11. राजवन्त राव – प्राचीन भारतीय मुद्राएं

प्रायोगिक तथा मौखिक परीक्षा **पूर्णांक – 50**

1. किसी महत्वपूर्ण पुरातात्विक/ऐतिहासिक स्थान का भ्रमण एवं विवरण प्रस्तुति – 20 अंक
2. पुरावस्तुओं की पहचान –20 अंक
3. मौखिकी –10 अंक

योग –50 अंक

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2017/17

ENGLISH LETERATURE

PAPER -I

INDIAN WRITING IN ENGLISH **M.M.: 75**

(Paper Code-0235)

All questions are compulsory.

Note : 1. Uint - I is compulsory. Two passages from each of the units II to V to be set and three to be attempted. (3x5 = 15)

2. Short answer questions from unit VII, seven to be set and five to be attempted. (5x2 = 10)

3. Long-answer questions from unit II to VI. Êive questions from each unit with internal choice to be set. (5x10 = 50)

UNIT-I Annotations and short answer questions.

UNIT-II Poetry -

	Toru Dutt	-	'Our Casurina Tree'
	Tagore	-	Songs 1 & 103 from 'Gitanjali'
	Sarojini Naidu	-	'The Ecstasy', 'The Lotus'
UNIT-III	Kamla Das	-	'The old playhouse'
	Gauri Deshpandey	Or	' The female of the species
	Jayant Mahapatra	-	'Dawn at Puri'
	K.N. Daruwala	Or	'Death by Burial'
	Shiv K. Kumar	-	'Indian Women'
UNIT-IV	**Prose -**		
	Nirad C.Choudhary	-	My Birth Place.
	Dr. S. Radhakrishnan	-	The call of the suffering.
UNIT-V	**Drama -**		
	Girish Karnad	-	Hayavadana
		Or	
	Tendulkar	-	Silence ! The Court is in session.
UNIT-VI	**Fiction -**		
	R.K. Narayan	-	Guide

UNIT-VII 1. Lyric, 2. Subjective poetry, 3. Couplet, 4. Fable, 5. Hymn, 6. Allegory, 7. Autobiography,

BOOK RECOMMENDED :

1. Indian Poetry in English, Ed. Hari Mohan prasad, Sterling Publication.
2. An Introduction to the study of English Literature, B. Prasad.
3. A Glossary of Literary Terms - M.H. Abrams.
4. Prose of To day - M.C. Millan.

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

PAPER - II

(A) AMERICAN LITERATURE

(Paper Code-0236)

All questions are compulsory.

Note : 1. Uint-I is compulsory. Two passages from each of the units II to V to be set and three to be attempted. (3x5 = 15)

2. Short answer questions from unit VII, seven to be set and five to be attempted. (5x2 = 10)

3. Long-answer questions from unit II to VI. (word limit for each answer is 300-400 (words) internal choice to be set. (5x10 = 50)

UNIT-I Annotations and short answer question.

UNIT-II Poetry -

Wait whitman	-	O Captain ! My Captain, when the Lilacs Last in the Dooryard Bloomed.
Carl Sandberg	-	'Who Am I ?', 'I am the People, The Mob'

UNIT-III

Emily Dickinson	-	'Hope is the thing with Feather' I Felt a funeral in My Brain'
E.E. Cummings	-	'The Cambridge Ladies' 'As Freedom is a Breakfast food'

UNIT-IV Prose -

William Faulkner	-	Nobel Award Acceptence Speech
W. Carlos Williams	-	In the American Grain
Walt Whitman	-	Preface to "Leaves of Grass'

UNIT-V Drama -

Miller	-	All My Sons
	Or	
Eugene O'Neill	-	The Hairy Ape

UNIT-VI Fiction -

E. Hemingway	-	A Farewell to Arms
	Or	
W. Faulkner	-	The Sound and the Fury

UNIT-VII 1. Naturalism, 2. Realism, 3. Art for Art's sake, 4. Poetic-Drama, 5. Symbolism, 6. American Renaissance, 7. Existentialism.

BOOK RECOMMENDED :

1. American Literature, An Anthology, Ed. Fr. Egbert S. Oliver.
2. A Glossary of Literary Terms - M.H. Abrams.

Dr. M. Chakraborty DR. S Gupta DR. MERILY ROY

PAPER - II
(B) 20TH CENTURY LITERATURE IN ENGLISH
(Paper Code-0237)

The paper will be taught as an optional paper to Paper-II(A) which is a paper on American Literature. The Principle focus will be to probe the students a general background and cultural history of this period and also to make them aware of the Literary trends of the twentieth century. The Paper will comprise six units and in all six quetions are to be attempted, one from each unit.

UNIT-I The following historical and literary topics will be included in this unit. Students are required to write short notes of not more than three hundred words on any two of the following topics. **(10 Marks)**

i) The Two world wars.
ii) The Russian Revolution.
iii) The Great Depression.
iv) The Vietnam war.
v) Freudian Thought
vi) Existentialism.
vii) Absurdism.
viii) Modernism and Post Modernism.
ix) New Development in fiction and Drama.

UNIT-II Ten objective type questions on the life History and major poetical works of the following poets of the twentieth century will be asked in this unit**.** **(10 Marks)**

i) W.B. Yeats (1865-1939)
ii) Siegfried Sasson (1886-1967)
iii) Rupert Brooke (1887-1915)
iv) T.S. Eliot (1888-1965)
v) Wilfred Owen (1893-1918)
vi) W.H. Auden (1907-1937)
vii) Louis Macneice (1907-1963)
viii) Stephen Spender (1909-)
ix) Dylan Thomas (1914-1953)
x) Philip Larkin (1922-1985)

UNIT-III (15 marks)

T.S. Eliot	-	'The Waste Land'
	Or	
Wilfred Owen	-	'Disabled'
Siegfried Sassoon	-	'Attack', 'Falling Asleep'
Rupert Brooke	-	'The Hill'
W.H. Auden	-	'Miss Gee'

UNIT-IV (15 marks)

Joseph Conrad	-	'Heart of Darkness'
	Or	
Chinua Achebe	-	'Things Fall Apart'

UNIT-V (Non Fictional Prose) (10 marks)

Virginia Woolf	-	'The Death of the Moth'
Graham Greene	-	'The Lost Childhood'

UNIT-VI (Drama) (15 marks)

Bernard Shaw	-	'Pygmalion'
	Or	
Samuel Beckett	-	'Waiting for Godot'

Dr. M. Chakraborty DR. MERILY ROY

संस्कृत साहित्य
प्रथम प्रश्न पत्र
नाटय, छंद तथा व्याकरण पुर्णांक – 75

इकाई–1 अभिज्ञान शाकुन्तलम् (कालिदास)

1. दो श्लोकों की ससन्दर्भ व्याख्या 20
2. एक श्लोक का अनुवाद 10

(प्रथम, चतुर्थ, पंचम और सप्तम अंक, व्याख्या हेतु, द्रुतपाठ – शेष अंक)

इकाई–2 अभिज्ञान शाकुन्तलम् – समीक्षात्मक प्रश्न 10

इकाई–3 निर्धारण छन्दों के लक्षण तथा उदाहरण 15

अनुष्टुप्, इन्द्रवज्रा, उपेन्द्रवज्रा, उनजाति, वंशस्थ, आर्या, मालिनी, शिखरिणी, वसन्ततिलका, शार्दुलविक्रीडित, स्त्रग्धरा, मन्दाक्रान्ता।

इकाई–4 व्याकरण – लघुसिद्धांत कौमुदी

कृदन्त प्रकरण

तव्यत्, अनीयर्, यत्, क्सप्, शत्, शानच्, क्त्वा, ल्यप्, क्त, क्तवतु, ण्वुल, तृच्, ल्युट, अण्

इकाई–5 व्याकरण – लघुसिद्धांत कौमुदी 10

1. तद्धित प्रत्यय अण्, ढक्, ष्यञ्, त्व, तढक्, अमनिच्, तठक्, अञ्, मतप्, इनि, इतच्, इष्ठन्, तरप्, मतप्, ण्य,यञ्।
2. स्त्री प्रत्यय, टाप्, ङीष्, ङीप्, ङीन।

अनुशंसित ग्रंथ –

1. शीघ्रबोध व्याकरणम – डॉ. पुष्पा दीक्षित, पाणिनीय शोध संस्थान, तेलीपारा, बिलासपुर
2. लघुसिद्धांत कौमुदी – श्रीधरानंद शास्त्री
3. संस्कृत हिन्दी कोश – वामन शिवनाथ आपटे
4. छन्दोमंजरी – चौखंबा प्रकाशन

Dr Suresh Tiwari Ar. Divya Deshpande.

प्रश्न पत्र द्वितीय
काव्य, अलंकार तथा निबन्ध पूर्णांक – 75
(पेपर कोड – 0258)

इकाई–1 किरामार्जुनीय (भारवि) प्रथम सर्ग
दो श्लोको की ससन्दर्भ व्याख्या 20

इकाई–2 किरामार्जुनीयम् – आलोचनात्मक प्रश्न 10

इकाई–3 मूलारामायणम् – वाल्मीकी
व्याख्या अथवा आलोचनात्मक प्रश्न

इकाई–4 अंलकार–
उपमा, रूपक, उत्प्रेक्षा, अर्थान्तरन्यास, स्वाभावोक्ति, काव्यालिग्ड., अतिशयोक्ति, दीपक, विभावना, विशेषोक्ति, अपह्नुति, दृष्टांत, प्रतिवस्तूपमा, निदर्शना, यमन, शब्दश्लेष, अनुप्रास, अनन्वय, ससन्देह, भ्रान्तिमान्।

टिप्पणी : अंलकारों के लक्षण चन्द्रालोक, साहित्य दर्पण, अथवा काव्य प्रकाश से अध्वेतव्य हैं, उदाहरण पाठ्यक्रमों से भी दिये जा सकते है ।

इकाई–5 निबंध (संस्कृत भाषा में) 15 वाकयों में 15
टिप्पणी : निबन्ध समीक्षात्मक अथवा विश्लेषणात्मक न होकर वर्णनारत्मक पूछे जोयेंगे ।

अनुवांशिक ग्रंथ :

1. संस्कृत निबन्ध शतकम् – डॉ. कपिलदेव द्विवेदी, चौखंबा प्रकाशन, वाराणसी
2. निबन्ध पारिजात – डॉ. रजनीकान्त लहरी, चौखंबा प्रकाशन, वाराणसी
3. रचनानुवाद कौमुदी – डॉ. कपिलदेव द्विवेदी, चौखंबा प्रकाशन, वाराणसी
4. प्रबंध रत्नाकर – डॉ. रमेशचन्द्र शुक्ल, चौखंबा प्रकाशन, वाराणसी

Dr. Suresh Mani Tiwari Asst. Divya Deshpande.

राजनीति विज्ञान
प्रश्न नत्र–प्रथम
अंतर्राष्ट्रीय राजनीति
(पेपर कोड– 0244) पूर्णांक – 75

इकाई –1 अंतर्राष्ट्रीय राजनीति का अर्थ, प्रकृति, क्षेत्र, अतंर्राष्ट्रीय राजनीति के अध्ययन के उपागम।

इकाई–2 अंतर्राष्ट्रीय राजनीति के विभिन्न सिद्धांत – शक्ति, परिभाषा, तत्व।
शक्ति संघर्ष, शक्ति संचय, शक्ति वृद्धि, शक्ति प्रदर्शन।

इकाई–3 शक्ति सन्तुलन की अवधारणा – सैद्धांतिक लाभ एवं मुल्यांकन ।
शांति एवं सुरक्षा की आवधारणा – सामूहिक सुरक्षा का सिद्धांत।

इकाई –4 राजनय परिभाषा, प्रकार, कार्य, उद्देश्य एवं साधन निःशस्त्रीकरण – अर्थ, परिभाषा एवं विकास, निःशस्त्रीकरण के मार्ग की बाधाएं एवं निराकरणै

इकाई–5 अंतर्राष्ट्रीय राजनीति के नए प्रतिमान :

1. पर्यावरणवाद,
2. वैश्वीकरण,
3. मानव अधिकार,

संदर्भ ग्रन्थ –

1. महेन्द्र कुमार – अन्तर्राष्ट्रीय राजनीति के सैद्धोतिक पत्र
2. विजय कुमार अरोरा –अन्तर्राष्ट्रीय राजनीति
3. दीनानाथ वर्मा – अन्तः संबंध – ज्ञानदर प्रकाशन, दिल्ली
4. मथुरालाल शर्मा – अन्तः संबंध – 1945 से, कॉलेज बुक डिपो, जयपुर
5. डी.सी. चतुर्वेदी – अन्तः संबंध – 1945 से, वर्तमान तक, रस्तौगी प्रकाशन, मेरठ
6. रमेश भारद्वाल – नवीन विश्व व्यवहार और भारती विदेश नीति
7. पंत एवं जैन – अन्तर्राष्ट्रीय संबंध, मीनाक्षी प्रकाशन, मेरठ
8. बी.के खन्ना एवं अरोरा – भारतीय विदेशनीति के नये आयाम, डी. के. प्रकाशन, नई दिल्ली
9. Palmar and Prkins - International Relations.
10. R. Aron - Peace & war - A theory of International Relations, London.
11. Organski - World Politics
12. C.P. Schliccher - International Relations, Co-operation and Competition.
13. J. Frankel - The making of Foreign policy, london, 1963.
14. H.J. Morgenthau - Politics Among Nations, 6th adition, New York, 1985.
15. K.N. Waltz - Theory of International Politics, Addison - Wesley, 1979.

प्रश्न पत्र– द्वितीय
लोक प्रशासन
(पेपर कोड – 0245) पूर्णांक – 75

इकाई –1 लोकप्रशासन का अर्थ, प्रकृति एवं क्षेत्र
एक अनुशासन के रूप में लोक प्रशासन का मुल्यांकन लोक प्रशासन एवं व्यक्तिगत प्रशासन में समानमाएं एवं व्यक्तिगत प्रशासन में समानताएं एवं असमानताएं।

इकाई –2 लोक प्रशासन के अध्ययन की पद्धति एवं उपागम,
नवीन लोक प्रशासन ।

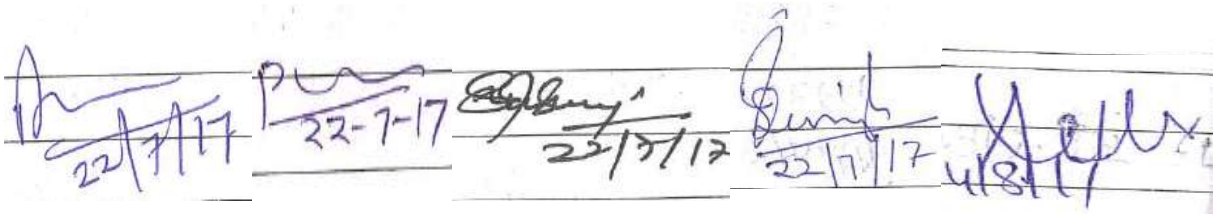
इकाई– 3 राजनीति एवं लोकप्रशासन
प्रशासनिक व्यवहार– नेतृत्व, निर्णय, निर्माण यंचार, जवाबदेही।

इकाई–4 नौकरशाही एवं बजट प्रक्रिया
वैश्वीकरण एवं उदारीकरण के युग में लोक प्रशासन के नये आयाम ।

इकाई –5 प्रशासन पर विधायी नियंत्रण,
प्रशासन पर न्यायिक नियंत्रण।

संदर्भ ग्रंथ –

1. सी.पी. भाम्भरी – लाक प्रशासन की सिद्धांत
2. पी.डी. शर्मा – भारत में लाक प्रशासन
3. खान एवं वर्मा – प्रशासनिक विचारधाराएं, भाग 1, 2
4. इन्द्रीजीत कौर – लोक प्रशासन, साहित्यभवन, आगरा
5. जे. पह शर्मा – लोक प्रशासन रायपुर
6. आर. बसु – लोक प्रशासन, नई दिल्ली, जवाहार पब्लिशर्स
7. बी. एल. फातिया – लोक प्रशासन – सहित्य भवन, आगरा
8. निशा वशिष्ठ – भारत में नौकरशाही की कार्यप्रणाली
9. सी.एन. चतुर्वेदी – तुलनात्मक लाक प्रशासन, जयपुर (कॉलेज बुक डिपो)
10. Pfittner J.M. – Public Administration.
11. White L.D. – Introdution to the Principles of Public Administration.
12. Bhambhari C.P. – Bureaucracy and Politics in India, Delhi Vikas 1971.
13. Bhattacharya M. – Public Administration.
14. Maheshwari S.R. – Indian Administration system.
15. Awasthi & Maheshwari – Public Administration.



ECONOMICS

PAPER - I

DEVELOPMENT AND ENVIRNMENTAL ECONOMICS M.M. 75

(Paper Code-0242)

UNIT-I Economic Growth and Development - Factors affecting economic growth, Capital and Technology Develompment & under development, Population of Under-developed Countries, Poverty - Absolut & Relative, Measuring development and Undevlopment, gap per capita income, inequlity of income and wealth.

Human Delopment index GDI, GEM, Poverty Index of development & Quality of life.

UNIT-II Population problem and growth, pattern of population. Theory of demographic trasition. Population poverty & Environment. Theory of Social Change Immutable laws of Capital Development - Crisis in capitalism. Karl Marx - Theory of Development, Mahalonobis four sectoral Model. Schumpeter's development in Capitalistic economy, Big-Push Balance and unbalanced Growth, Critical Minimum Effort thesis, Low Income Equilibrium Trap-Dualism : Technical, Behavioural & Social.

Unit-III Harrod and Domar Growth Model, Neo Classical models, So low, Meade & Mrs. Joan Robinson's Growh model, Unlimited supply of Labour.

UNIT-IV Environment and Ecology : Economic linkage, Environment as a necessary and luxury, Population environment linkage, Environmental use & environmental disruption as an allocation problem. Market failure for environmental goods, environment as a public good, the Common problem. Property Human right approach to environmental problem, valuation of environmental damages-land, water, air & forest Pollution Control-Prevention. Control and asbtement of pollution Choice of policy instruments in developing Countries, Environmental legislation Indicators of Sustainable Develop-ment, environmental accounting.

UNIT-V Concept of Intellectual Capital - Food Security, Education Helath & Nutrition, Efficiency & Productivity in Agriculture New Technology & Sustainable Agriculture, Globalization & Agriculture growth, the Choice of Technique & appropriate technology & employment. Role of Monetory & Fiscal policies in developing Countries.

PAPER - II

STATISTICAL METHODS **M.M. 75**

(Paper Code-0243)

UNIT-I Statistical Methods Statistcs - Definition Statistical Data, Statistical Methods, Functions of Statistics. Importance of Statistics, Limitations of Statistics. Statistical Survey & Report writing. Collection of Data, Primary & Secondary Data, Sampling & Sampling Designs. Sampling Errors, Frequency Distribution, Diagrammatic & Graphic Presentation.

UNIT-II Central Tendency. Measurement of Mean, Median, Mode, Geometric Mean & Harmonic Mean and their uses.

UNIT-III Dispersion : Meaning of Dispersion, Properties good measure of Variation - Methods of Despersion Range, Quartiles Deviation - Mean Deviation, Standard Deviation, Coefficaient of Variation, Lorenz Curve, Skewness & Kurtosis.

UNIT-IV Coefficient of Correlation - Karl Pearson's Method, Probable Error, Spearman's Rank Correlation Coefficient.

UNIT-V Index Number - Construction of Index Numbers Simple & weighted Index Number's- Fisher's Ideal Index Number & Reversal Test. Consumer Price Index Numbers and Time Seris Analysis - components of Time-Series.

Measurement of Trend - Graphic Method, Semi Average Method. Moving averages, Least Square Method, Measuring Trend by logariths.

BOOK RECOMMENDED:

1. Salvalore, D.L. (1997), International Economics, Prentice Hall, Upper Saddle River, N.J.
2. Sodersten, Bo (1991), International Economics, Macmillan Press Ltd. London.
1. Aggarwal, M.R. (1979), Regional Economic Cooperation in South Asia, S. Chand and Co. New Delhi.
2. Bhagwati J. (Ed.) (1981), International Trade, Selected Readings, Cambridge University Press, Mass.
3. Creckjell A. (1982), International Mony, Issue and Analysis, E.I.B.S and Nelson, London.
4. Greenaway, D. (1983) International Monetary Economics, Prentice Hall Indoa.
5. Joshi V. and I.M.D. Little (1998), India's Economic Reforms, 1999-2001, Oxford University Press, Delhi.
6. Panchmukhi, V.R. (1978) Trade Policies of India : A Quantitative Analysis, Concept Publishing Company. New Delhi.
7. Patel, S.J. (1995) Indian Economy Towards the 21st Century. University Press Ltd. India.
8. Singh M. (1964), India Export Trends and the Prospects for sell sustained growth Oxford Univesity Press, Oxford.

इतिहास
प्रश्न–पत्र प्रथम
भारत का इतिहास सन् 1761 ई. से 1950 ई. तक
(पेपर कोड–0240)

पूर्णांक 75

उद्देश्य :इस पाठ्यक्रम का उद्देश्य आधुनिक काल में भारत के राजनीतिक, सामाजिक आर्थिक एवं सांस्कृतिक इतिहास से विद्यार्थियों को अवगत कराना है ।

इकाई–1

1. ब्रिटिश साम्राज्य का विस्तार एवं सुदृढ़ीकरण – युद्ध एवं कुटनीति – कनार्टक युद्ध
2. ब्रिटिश साम्राज्य का विस्तार एवं सुदृढ़ीकरण –प्लासी एवं बक्सर
3. सहायक संधि एवं हड़प नीति (व्यपगत का सिद्धांत)
4. ब्रिटिश प्रशासन एवं सुधार – बेंटिंग, लिटन, रिपन, कर्जन

इकाई–2

1. वाणिज्यवाद – उद्योगों का पतन
2. वाणिज्यवाद – व्यापार का पतन
3. कृषि का ह्रास एवं कृषक आन्दोलन
4. भूराजस्व व्यवस्थाएं – स्थाई बन्दोबस्त, रैयतवाड़ी, महालवाड़ी

इकाई–3

1. भारतीय पुनर्जागरण – ब्रह्म समाज, आर्य समाज, प्रार्थना समाज,
2. श्रामकृष्ण मिशन, थियोसोफिकल सोसायटी, अलीगढ़ आन्दोलन
3. पाश्चात्य शिक्षा का विकास एवं प्रेस
4. विभिन्न सामाजिक वर्ग – कृषक, मजदूरी, मध्यम वर्ग एवं महिलाएं

इकाई–4

1. राष्ट्रवाद का उदय एवं 1857 की क्रांति
2. भारतीय राष्ट्रीय कांग्रेस – उदारवादी, उग्रवादी
3. क्रान्तिकारी आन्दोलन गांधीवादी आन्दोलन

इकाई–5

1. साम्प्रदायिकता : उदय एवं विकास
2. सुभाषचन्द्र बोस एवं आजाद हिन्द सेना
3. भारत का संवैधानिक विकास : 1919 ई. – द्वैध शासन 1935 – प्रान्तीय स्वायत्तता
4. भारत की स्वतंत्रता तथा भारतीय संविधान की विशेषताएं।

संदर्भ ग्रंथ :

1. Sarkar and Dutt – ModernIndia(EnglishandHindiVersion)
2. Singh, Nihal – Landmarks in Indian Constitutional Development and National Movement.
3. Agrawal R.C. – Indian Constitutional Development and National Movement in India.
4. राधेशरण – भारत की सामाजिक एवं आर्थिक संरचना और संस्कृति के मूल तत्व (आदिकाल से 1950 ई. तक) (म.प्र. हिन्दी ग्रंथ अकादमी का प्रकाशन)

20/7/17

5. मिश्रा जे.पी	–	आधुनिक भारत का इतिहास
6. नागौरी एस.एल. लाल	–	आधुनिक भारत का इतिहास
7. ग्रोवर बी.एल.	–	आधुनिक भारत का इतिहास
8. दुबे सत्यनारायण	–	आधुनिक भारत का इतिहास
9. मजूमदार दत्त राय चौधरी	–	भारत का वृहत इतिहास
10. जैन एम.एस.	–	आधुनिक भारत का इतिहास
11. सिंह प्रपात	–	आधुनिक भारत का सामाजिक एवं आर्थिक इतिहास
12. सिंह प्रपात	–	आधुनिक भारत (1858–1919)
13. सिंह प्रपात	–	आधुनिक भारत (1919–1950)
14. दिल्ली विश्वविद्यालय प्रकाशन	–	आधुनिक भारत का इतिहास
15. दिवाकर ब्रज मोहन	–	आधुनिक भारत
16. छाबड़ा जी. एस.	–	आधुनिक भारत का इतिहास (तीन खण्डों में)
17. नगपाल ओभ	–	भारत का राष्ट्रीय आन्दोलन और.....
18. सीता राम शर्मा	–	उन्नीसवीं सदी भारतीय धार्मिक तथा सामाजिक जागरण
19. डॉ. सीताराम जी 'श्याम '	–	भारतीय स्वतंत्रता संग्राम की रूपरेखा
20. विपिन चन्द्रा	–	भारत का स्वतंत्रता संग्राम
21. रामलखन शुक्ल	–	आधुनिक भारत
22. रमेशचन्द्र दत्त	–	ब्रिटिश बारत का आर्थिक इतिहास
23. डॉ. आयोध्यासिंह	–	भारत का मुक्ति संग्राम
24. डॉ. एग्नेस ठाकुर	–	आधुनिक भारत का इतिहास

प्रश्न– पत्र द्वितीय
विश्व इतिहास – सन् 1871 ई. से 1945 ई. तक
(पेपर कोड – 0241) **पूर्णांक 75**

उद्देश्य : इस पाठ्यक्रम का उद्देश्य विश्व इतिहास की प्रमुख घटनाओं से विद्यार्थीयों को अवगत कराना है साथ ही अन्तर्राष्ट्रीय परिदृश्य का ज्ञान भी इन्हें देना है ।

इकाई–1

1. फ्रांस का तृतीय गणतंत्र
2. बिस्मार्क – सह एवं विदेश नीति
3. विलियम द्वितीय की विदेश नीति
4. अफ्रीका का विभाजन

इकाई–2

1. जापान का आधुनिकीकरण
2. रूस – जापान युद्ध : कारण एवं परिणाम
3. चीन की क्रान्ति – कारण एवं परिणाम
4. डाफ. सन–यत–सेन

इकाई–3

1. पूर्वी समस्या– बलिदान कांग्रेस, युवा तुर्क आन्दोलन
2. बाल्कन युद्ध : करण एवं परिणाम
3. प्रथम विश्व युद्ध : कारण एवं परिणाम
4. रूस की क्रान्ति 1917

इकाई–4

1. वर्साई की संधि
2. फासीवाद – मुसोलिनी
3. नजीवाद – हटलर
4. जपान का सैन्यवाद – तोजो

इकाई–5

1. राष्ट्रसंघ : स्थापना एवं विल्सन के 14 सूत्र
2. द्वितीय विश्वयुद्ध – कारण एवं परिणाम
3. संयुक्त राष्ट्र संघ – स्थापना एवं संगठन
4. संयुक्त राष्ट्र संघ – उपलब्धियां

अनुशंसित ग्रंथ :

1. Grant and Temperley - Europe in the 19th and 20th Century (also Hi-- Version)
2. Kettelby - History of the Modern Times
3. Moon - Imperialism in World Politics
4. Plamor & Parkins - International Politics
5. Parks, Hengy Bamford - The United States of America A History

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6. Panikkar K.M. - Asia and Western Dominance
7. Schuman - International politics
8. Taylor, A.J.P. - Struggle for Mastery over Europe
9. Vinacke, H.M. - A History of Far East in Modern Times
10. Fay - Origins of the World War
11. Robert. Engong - Europe since waterloo
12. Manazir Ahmad - Europe ka Itihas (in Hindi)
13. Satyaketu Vidyalankar - Sudurpurva ka Itihas (in Hindi)
14. Deonath Verma - Aungla ka Itihas (in Hindi)
15. वर्मा भगवान सिंह – विश्व इतिहास की प्रमुख धारायें (1871–1956) (म.प्र. हिन्दी ग्रंथ एकादमी का प्रकाशन)
16. शर्मा भथुरालाल एवं बघेला हेतसिंह – युरोप का इतिहास (1789–1945) : एक शोध पूर्ण अध्ययन एवं माधुर कौशिक इत्यादि
17. अहमद लइक – आधुनिक विश्व का इतिहास

G E O G R A P H Y

1. The B.A. Part III Examination in Geography will be of 150 marks. There will be two theory papers and one practical each of 50 marks as follows :

   Paper – I Resource and Environment
   Paper – II Geography of India (with special reference to Chhattisgarh)
   Paper – III Practical Geography

2. Each theory paper shall be of three hours' duration.
3. Candidates will be required to pass separately in theory and practical examinations.
4. Each theory paper is divided into five units.
5. (a) In the practical examination the following shall be allotment of time and marks.

i)	Lab work	-	20 marks	up to three hours
ii)	Survey	-	10 marks	Two hours
iii)	Field Report	-	10 marks	
iv)	Practical Record and viva-voce	-	10 marks	

   (b) The external and internal examiners shall jointly submit marks.
   (c) The candidates shall present at the time of the practical examination their practical records regularly signed by the teachers concerned.

PAPER - I
RESOURCES AND ENVIRONMENT M.M. 50
(Paper Code-0248)

A. Resources

UNIT-I Meaning, nature and components of resources and environment. Resources and environment interface. Classification of resources : renewable and nonrenewable : biotic (forests, wild-life, live-stock, fisheries, agricultural crops) and abiotic (land, water, mineral)

UNIT-II Distribution and utilization of water mineral and energy resources, their economic and environmental significance and conservation. Types and distribution of forests, fauna and fisheries, their economic, and environmental significance and conservation. Major soil types and their distribution; problems of soil erosion and soil conservation.

UNIT-III Number, density, growth and distribution of population; population pressure and resource utilization.

B. Environment

UNIT-IV Classification of environment: Natural and Human. Man environment interrelations with respect to population size, types of economy and technology; exploitation of natural resources and environmental hazards.

UNIT-V Emerging environmental issues - population explosion; food security; deforestation; global warming, conservation of bio-diversity; sustainable development.

PAPER - II

GEOGRAPHY OF INDIA **M.M. 50**

(With Special reference to Chhattisgarh)

(Paper Code-0249)

UNIT - I Physical features : Structure, Relief and Physiographic regions, Drainage, Climate-origin and mechanism of monsoon, and regional and seasonal variation.

UNIT-II Natural resources : Soils - types, their distribution and characteristics. Water resources (major irrigation and hydel power projets); Forests-types, distribution, economic significance and conservation. Mineral and Power resources-Iron-ore, Manganese, Copper, Coal, Petroleum and Natural gas, Non conventional sources of energy.

UNIT-III Cultural Features : Agriculture - Major crops, impact of green revolution and agricultural regions; Industries - Iron and steel, Cotton Textile, Cement, Sugar, Population - growth, density and distribution. Transport, Foreign Trade.

UNIT-IV Chhattisgarh :

Physical Features : Structure, Physiography, Drainage, Climate, Soils, Natural vegetation, Water resources - availability and development. Mineral and Power resources, Power projects.

UNIT-V Chhattisgarh :

Cultural features : Agriculture, Industries, Population - growth, distribution and density, social groups, literacy and sex-ratio, urbanisation. Major tribes-their habitat, economy and society. Transport and Tourism.

SUGGESTED READING :

1. Sharma, T.C. and Coutinho, O. : Economic and Commercial Geography of India, Vikas Pub. House, New Delhi, 1988.
2. Singh, R.L. (Ed.) : India : A regional Geography, Nat. Geog. Soc. of India, Varanasi, 1971.
3. Spate, O.H.K. and Learmonth, A.T.A. India and Pakistan : A General and Regional Geography, Methuen & Co. Ltd. London, 1967.
4. Tiwari, R.C. : Geography of India, Prayag Pustak Bhawan. Allhabad, 2003.
5. प्रमीला कुमार (सम्पादक) : मध्प्रदेश का प्रादेशिक भूगोल, म.प्र. हिन्दी ग्रंथ अकादमी, भोपाल
6. अग्रवाल प्रेमचंद : भारत का भौतिक भूगोल

PAPER - III

PRACTICAL GEOGRAPHY **M.M. 50**

UNIT-I Band graph, Hythergraph and Climograph. Square root, cube-root and vernier scales.

UNIT-II Map Projection : Conical Projection : one standard parallel, two standard parallels, Bonne's, Ploy conic, Polar Zenithal Projections; Gnomonic, Stereographic and Orthographic.

UNIT-III Study and Interpretation of Indian topographical sheets : classification and numbering system, Interpretation of topographical sheets with respect to cultural and physical features.

UNIT-IV Surveying - Plane Table Survey, Basic Principles of plane table surveying, Plane table survey including intersection and resection.

UNIT-V Importance of field work in Geography. Field work and field report : physical, social and economic survey of a micro-region.

MUSIC

PAPER - I

THEORY OF INDIAN MUSIC, VOCAL/INSTRUMENTAL M.M.:50

(Paper Code-0264)

I. Definitions and Elementary Knowledge of the following terms : Shruti, Gram, Murchana, Jaati, Sadaj-Pancham Bhav, Sadaj-Madhyam Bhav, Sada-jantar Bhav, Chatuh Sarana by acharya Bharat, Praman Shruti, Kaku Bhed, Jhala, Razakhani gat, Maseetkhani gat, Toda.

I. Introduction of Harmony and Melody Characteristics and comparative study of Harmony and Melody.

III. Methods of Placement of swars :

(a) Method of placing shudha and Vilkrit Swaras on Veena by Ahobal, Pt. Srinivas and Pt. V.N. Bhatkhande.

(b) Shruti Swar system of different granthakars (authors) Ancient, Medieval and Modern period.

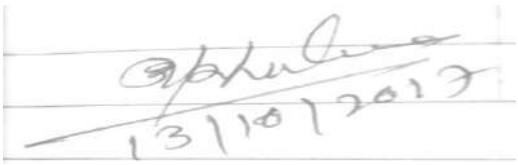
IV. Evolution and Development of Swar Saptaka of western and Indian scales :

(a) Phthogorian Scale.
(b) Scale from Sadaj-Pancham Bhav,
(c) Scale from Sadaj-Madhyam Bhav,
(d) Equally tempered Scale
(e) Diatonic Scale
(f) Mean tempered Scale
(g) Concept of Acharya Bharat and Bilawal Thata.
(h) Chromatic Scale.

V. Definition and prime elements of Gharana and their history.
Gwalior, Agra, Kirana, Patiyala, Jaipur, Senia Gharana of Instrumental Music.

VI. Difinition of Gram and Gram Bhed -
Sadaj Gram, Madhyam Gram, Gandhar Gram and their Swaras.

VII. Writing of Talas in Natation with Dugun and Chaugun layakaris in all the Talas prescribed in Ist and IInd Year.



PAPER - II

THEORY OF MUSIC, VOCAL/INSTRUMENTAL M.M.:50

(Paper Code-0265)

1. Study of Theoritical details of Ragas prescribed for practical course and their comparative study.
2. Writing in notation of Bandish / Gat of prescribed Ragas.
3. Biographics and contributions of the musicians : Haddu - Hassu khan, Inayat Kan, Pandit Omkar Nath Thakur, Matang, Ramamatya, Srinivas, Lochan, Hrideya Narayan Dev, Somnath, Bhav Bhatta.
4. History of Indian Music : Medieval and Modern period; Analytical study of the styles, position and effects of granthkaras and eminent musician of medieval and modern Period.
5. Classical Music and Folk Music : Comparative study of Classical and Folk music. Intensive study of the Folks of Chhattisgarh.
6. Voice-Culture : Definition, Importance and utility of vioce-culture. Construcution of throat and production of sound. General sicentific methods of voice-culture.
7. Guided listening to Radio and T.V. national Programmes of Indian classical Music and ability to write their critical appreciation.
8. Essay on topics related to music.

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PRACTICAL
VOCAL/INSTRUMENTAL

I. Study of Eight Ragas from the following :
Ramkali, Jaijaiwanti, Miyan ki Malhar, Pooriya, Basant, Bahar, Darbavi Kanhada, Miyan ki Todi, Adana, Kalavati, Hansdhwani, Shuddhkalyan, Pooriyadhamashri, Marwa.

1. Two Vilambit Khayalas / Maseetkhani Gats in any of the above mentioned Ragas with Alap and Tanas / Todas.
One Vilambit Khayalas / Maseethkhani / Gat choice Raga and one asked by the examiner. (5+5 = 10 marks)

3. Lakshan Geets, Sargams, Madhayalaya Khyals / Razakhani Gats with Tanas / Todas in all the eight Ragas. (5+5 = 10 marks)

4. Study of One Dhrupad and one dhamar with Dwigun, Trigun Chaugun / study of Two Madhayata gats in other than Trital out of the Ragas precribed in the course. 8 marsk

5. Study of one Tarana, One Bhajan / One Dhun. 4 marks

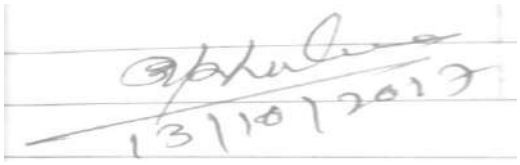
6. Ability to demonstrate (orally by given Tali Khali on hand) Talas prescribed in 1st year and IInd year Matta Tala, Panjabi Trital, Ganesh Tal, Rudra Tala. 4 marks

SESSIONAL WORK

1. Keeping upto date practical and theory note Books. Attendence and activities in the class and college.
2. Ten descriptions of Music programmes of Radio, T.V. or personally attended.

BOOK RECOMMENDED:

1. Kramik pustak Malika Part I, II, III, IV by Pt. V.N. Bhatkhande.
2. Sangeetanjali Part I, II, III, IV, V, VI by Pt. Omkarnath Thakur.
3. Raga Vigyan Part I, II, III, IV, V by Pt. V.N. Patvardhan.
4. Rag Bodh. B.R. Devdhar, Part I, II & III.
5. Sitar Vadan, S.G. Vyas.
6. Sangeet Visharad, Vasant
7. Sangeet Bodh - S.C. Paranjape
8. Sangeet Darshika - Navigopal Banerjee
9. Sangeet Shastra Darpan - Shanti Gowardhan Part I, II & III
10. Dawadhavi and Sangeet - Lalit Kishore singh
11. Shrimallakshay Sangeetam - Chatur Pandit.



PSYCHOLOGY

PAPER - I

PSYCHOLOGICAL STATISTICS

M.M.:50

(Paper Code-0250)

UNIT-I Statistics: Meaning and application in Psychology, nature of score, categorical and continuous variables, frequency distribution, Graphic representation of data.

UNIT-II Measures of Central Tendency : Mean, Median and mode of group and un group data, Measures of variability : Range, S.D., Q.D., A.D., applications of measures of central tendency and variability.

UNIT-III Nature and characteristics of normal probability curve : concept of skewness and Kurtosis, Correlation : Concept, Types and methods - rank difference and product moment (in ungrouped data), Biserial and Tetrachoric coefficient.

UNIT-IV Inferential statistics: Concept of null Hypothesis, level of significance, type I error & type II error, T-test (uncorrelated data)

UNIT-V Distribution free statistics: Chi-square, Median and sign test, applications of computer in psychological statistics.

REFERENCES:

1. Siegel S., (1994) Non parametric statistics New York : Mcgraw Hill

   Garret: Statistics in Psychology and Education Times of India Publisher.

2. कपील एस. के. – सांख्यिकी के मूल तत्व

   गैरेट– मनोविज्ञान एवं शिक्षा में सांख्यिकी

1.8.17 11/8/17 1.8.17

PAPER - II (Optional)

(A) HUMAN DEVELOPMENT **M.M.:50**

(Paper Code-0251)

Candidate has to opt. any one of the following Optional papers.

UNIT-I Concept of Human Development, Theories of Human Development: Psychoanali-tical and Maslow, Determinants of Human Development - Biological, social, cultural factors, Approaches to study human developments: Longitudinal and cross - sectional.

UNIT-II Socialisation : Role of family, peers and school, Media and socialisation, Ecological factors in Human Development, Cognitive Development : Theoritical Perspectives Piaget, Information Processing, Vyogotsky.

UNIT-III Self and Identity : Emergence of self, Development of personal identity, identity crises, Physical and sexuel maturation, Sequential development of emotions.

UNIT-IV Development of morality and self concept, Development of gender differences and gender roles. Role of marriage, family and occupation in Human Development.

UNIT-V Problems of Aging - Cognitive, conative, affective, Developmental Disabi-lities.

BOOK RECOMMENDED :

1. Berk L.E. (1989) Child Development. Boston : Allyn and Bacon.
2. Santrock J.W. (1999) Lifespan development. New York McGraw Hill.
3. E.B. Hurlock (1997) Development Psychology : A life span approach. V, edition.
4. शाह गोवर्धण – विकासारात्मक मनोविज्ञान

PAPER - II (Optional)

(B) ENVIRONMENTAL PSYCHOLOGY M.M.:50

(Paper Code-0252)

UNIT-I Evaluing environmental ethics from values about nature in the ancient India systems. Earth as a living system, Psychological approaches to environment : Eco cultural Psychology (Berry), Bio-social Psychology (Dawson), Ecological Psychology (Berkar) Person Environment Transactions (sokols, Itlelson)

UNIT-II Effects of environment on behaviour : Noise pollution chemical Pollution, crowding and personal space. Effect of behaviour on environment : Perception, Preferences and awareness of environment.

UNIT-III Human Nature and environmental problems : Pro-social and pro environment behaviours, Eco-systems and their components Demography : Mortality and fertility, Resource Use : Common Property resources, Sustainable Development, Ecology : Acculturation and Psychological adaptation.

UNIT-IV Methods : Naturalistic observetion and field surveys. Environmental Assessment : Naturalistic observation and field surveys Socio - Psychological dimensions of environments impact Environmental deprivation : Nature and consequences, Creating environmental awareness - Social Movements : Chipko, Tehri Narmad.

UNIT-V Application of Psychology in man environment fit : Education - Classroom environment, Industry - Industrial / Organisational effectiveness, Health - Physical, mental and spiritual, Social - Communal harmony and National integration.

REFERENCES :

1. Goldsmith E. (1991) - The way : The ecological world vic Boston : Shambhala.
2. Jain U (1987) The Psychological consequences of crowding New Delhi : Sage.
3. Mishra R.C. Sinha D & Berry, J.W. (1996) Ecology, Community and life style, New Delhi.

PSYCHOLOGY PRACTICALS M.M.:50

This paper carries 50 marks. It comprises of two parts. Part A comprises of psychological experiments and testing while part B comprises of complition of Project Report.

PART - A

Note : From the following experiment any 5 are to be done-

1. Bilateral transfer of training.
2. Measurement of Illusion.
3. Habit interference.
4. Effect of need priority on selection of Advertising material.
5. Effect of mental fatigue upon performance.
6. Reaction Time
7. Effect of frustration on learning.
8. Depth Perception.

Note : From the following tests any 4 are to be done-

1. Level of aspiration
2. Need for guidence
3. Maturity scale
4. Attitude Scale.
5. Classroom environment scale.
6. Mental health
7. Family environment test
8. Test of Moral values.

PART - B

The condidate will be alloted a topic of project by the departmental committee. He/she is required to carry out a small scale project based on small sample. He/she is required to complet the project and submit its report. 15-20 pages, covering all major steps of scientific enquiry under the supervision of the departmental teacher. This will be the part of practical work. The soggested areas for the project work are as under Mental health, sibling rivarly, deprivation, identity crises, drug abuse aging media effect, woman employment, Job sotisfaction, stress, stren management, problems of adolscent etc.

DISTRIBUTION OF MARKS

Conduction of Experiment	-	10 marks
Administration of test	-	10 marks
Evaluation of Project Report and Practical record	-	10 marks
Viva - Voce	-	10 marks

Note : Candidate is required to attend practical work regularly. His/Her attendence should not be less than 75%. If his / her practical work performance is not satisfactory, he / she shall be debarred from the examinations.

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ANTHROPOLOGY

PAPER-I (Paper Code-0275)

"FUNDAMENTALS OF HUMAN GENETICS & HUMAN GROWTH"

AIM- The aim of this paper is to introduce the students the basics of Human Genetics and Human Growth.

UNIT-I Human Genetics : aims and scope. Cell division : Mitosis and Meiosis. Mendelism, Chromosomes ; Normal and Abnormal chromosomes. Genes, concept of DNA & RNA. Types of Inheritance : autosomal, (Dominant and Recessive). Sex linked Inheritance.

UNIT-II Concept of Race. Formation of Racial groups. Criteria for racial classification. Racial elements in India. Major stocks of the world and their broad sub divisions.

UNIT-III Types of twins and their importance in genetic investigation. Inheritance of ABO Blood groups, P.T.C., Colour blindness and dermatoglyphics. Genetic councelling, Eugenics. Population Genetics.

UNIT-IV Definition and scope of Human growth. Methods of studying human growth and Development. Ageing, Nutritional requirement for normal growth. Common nutritional disorder (Protein, Fat, Carbohydrates, Mineral, Vitamin).

UNIT-V Ecology : definition and scope. Varieties of human ecosytems. Environmental Population. Definition, nature and scope of biological demography. Demographic Profiles : Fertility, Mortality, Morbidity.

RECOMMENDED READINGS :

1. Agrawal S.N. : India Population Problems
2. Bogue : Principles of Demography
3. Bresler : Human Ecology
4. Gran and Shamir : Methods of Research in Human Growth
5. Harri.II. : Biochemical Genetics Man
6. Harrison. A.E. (editor) : Human Biology
7. Phyllis and Home, P.S. : Basic nutrition in health & disease
8. Race, R.R. & Sanger R. : Blood Group in Man
9. Stern C. : Principles of Human Genetics
10. Tanner, J.M. : Human Growth
11. Theodarson : Studies in Human Ecology
12. Walson and Lowry : Growth and Development of Children
13. Winchester A.W. : Principal of Genetics
14. रघुवंशी अरूण एवं चन्द्रलेखा : पर्यावरण प्रदूषण
15. Sinnot, Dunn & Dozansky : Principles of Genetics

27.10.17

PAPER-II (Paper Code-0276)

THEORIES IN SOCIAL CULTURAL ANTHROPOLOGY

AIM : The main aim of this course is to introduce the student about the basic pricinciples and Theories of Social cultural Anthropology to-provide preliminary understatnding of various theoretical models evolved by Social and Cultural Anthropology.

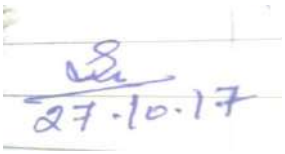
UNIT-I The contributions made by the following Anthropologists to Social-Cultural Anthropology.
(I) E.Durkheim, (II) F. Boas, (III) R. Redcfield, (IV) A. L. Kroeber, (V) S.C. Dube, (VI) M.N. Shrinivas, (VII) L.P. Vidyarthi.

UNIT-II Evolution: Biological and cultural Evolutionism; classical Evolutionism; E.B. Tylor, L.H. Morgan.
Neo - Evolutionism; jLeslie white, Gordon childe.
Culture traits, Culture Complex, Culture Area, Culture focus.
Diffusion of Culture : British diffusionist : Genrman - Austrian diffusionist (Kuttre kriese American diffusionist (Culture Area).

UNIT-III Function and structure: Functionalism (Malinowski) and Structure Functionalism (Redcliffe Brown) Structuralism (Levi strauss).

UNIT-IV Personality : Basic personality and Model personality.
Culture pattern : Configurationalism (Ruth Benedict). Anthropological study of National character.

UNIT-V Feild work tradition in Anthropology Major tools of Research: Schedule, Questionaire, Participant observation, interview, case study, Geneological Method. The main bases of Anthropological Methods: Historical Method, Comparative Method and Functional Method.



PAPER-III

PRACTICAL

Obejctive : The main of this practical coures is to introduce the student about the tools and Method, analysis & statistical methods used in Human Biology. Laboratory Procedures in blood grouping and dermatoglyphics would give confidence in Dealing with all the applied dimensions they process.

PART-I : Somatometry :

(a) Measurements on body :

(i) Height vertex, (ii) Height tragus, (iii) Suprasternale height, (iv) Biacromial Breadth, (v) Bi-illioncristal breadth, (vi) Tibial Height, (vii) Upper extremity Length, (viii) Sitting height, (ix) height dactylion, (x) Body weight.

(b) Head and Face Measurement :

(i) Morphological upper facial length.
(i) Morphological facial length.
(v) Max head length
(vii) Nasal length
(i) Physiognomic upper facial length.
(iv) Bizygomalic breadth.
(vi) Max head breadth
(viii) Nasal breadth

(c) Indices :

(i) Cephalic Index
(i) Facial Index
(i) Nasal Index

PART-II Genetic Traits :

ABO blood group ; colour blindness, PTC taste sensitivity, Dermatioglyphics, Methods of taking finger and palm prints and their analysis.

PART-III Statistics

Mean, Median, Standard deviation, X2 test.

BOOKS RECOMMENDED:

1. Basin M.K. and I.P. Singh : Anthropometry
2. Cummins H. and Midlo C. : An Introduction of Dermatoglyphics
3. Dunsford and Bowley : Blood Group Techniques
4. Fisher R.S. : Statistical methods for Research Workers
5 मित्रा मिताश्री : प्रायोगिक मानव विज्ञान भाग–2
6. Olivia Practical Anthropology

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27.10.17

भाषाविज्ञान
प्रश्न पत्र प्रथम
भाषा का सामाजिक परिप्रेक्ष्प
(पेपर कोड – 0238) **कुल अंक : 75**

इकाई –1 भोलाराम तिवारी व्यक्ति , भाषा एवं समाज – भाषा–ज्ञान–सहजात एवं सामाजिक संदर्भ, भाषा–संप्रेषण, साधना के रूप में, साण्स के स्न में, भाषा एवं अस्मिता, भाषा के माध्यम से सामाजिक संरचना।

इकाई –2 भाषा का सामाजिक संदर्भ – मानक भाषा, परिनिष्ठित भाषा, पिजिन एवं क्रियोल, क्षेत्रीय भाषा, संपर्क–भाषा, डिग्लोसिया (भाषा–द्वैत)।

इकाई– 3 भाषा–भेद–सामाजिक एवं क्षेत्रीय भेद, सामाजिक एवं भाषिक भेद में संबंध, समाजभाषिय परिवर्त।

इकाई –4 भाषा–नियोजन–उद्देश्य, राष्ट्रीय नियोजन के अंग के रूप में भाषा–नियोजन, भाषा–मानकीकरण।

इकाई–5 द्विभाषिता एवं बहुभाषिकता – कोड–मिश्रण एवं कोड–परिवर्तन।

निर्धारित पुस्तकें :

1. हिन्दी का सामाजिक संदर्भ – रामनाथ सहाय एवं अन्य (सं.), केन्द्रीय हिन्दी संस्था, आगरा
2. हिन्दी भाषा का समाज शास्त्र – रवीन्द्रनाथ श्रीवास्तव
3. हिन्दी भाषा का सामाजिक सरंचना – डॉ. भोलाराम तिवारी (सं.)
4. हिन्दी का साामाजिक भूमिका – डॉ. भोलाराम तिवारी एवं मुकुल प्रियदर्शिनी
5. Sociliryuistics : R.s. Hudson, Cambridge University Press Cambridge
6. An Introduction to Sociolinguistics : R. Warddhangh, Prenguin, Hurm.

द्वितीय प्रश्नपत्र
भाषा एवं साहित्य
(पेपर कोड –0239) **कुल अंक : 75**

इकाई –1 भाषा एवं साहित्य का संबंध – मानक भाषा और काव्य भाषा, सामान्य भाषा और काव्य भाषा, भावनात्मक भाषा एवं वैज्ञानिक तथा तकनीकि भाषा, भाषा की सर्जनात्मकता, भाषा का सौंदर्यशास्त्र काव्यशास्त्र एवं साहित्यिक समीक्षा।

इकाई–2 शैली एवं प्रकार्य – शैली विज्ञान एवं भाषाविज्ञान का संबंध, शैली की उपयोगिता, शैली–भेद एवं संदर्भ–भेद, भाषा प्रयोग एवं संदर्भ।

इकाई –3 प्राक्ति –परिभाषा एवं विभिन्न आधारों पा प्राक्ति के प्रकार, चयन विचलन, समांतरता, प्रतीकात्मकता एवं बिम्बात्मकता ।

इकाई –4 भाषा–शिक्षण – सिद्धांत एवं महत्व, भाषा–शिक्षण की विधियां, मातृभाषा शिक्षण, अन्य भाषा–शिक्षण, अन्य भाषा के रूप में हिन्दी का शिक्षण, भाषा–शिक्षण में व्याघात, संस्कृति का प्रभावं।

इकाई –5 साहित्य–शिक्षण – साहित्य–शिक्षण : उद्देश्य, विधियां, एवं सिद्धांत, कविता–शिक्षण, नाट्य–शिक्षण, कहानी–शिक्षणका परिचय, साहित्य–शिक्षण में दृश्य–श्रण्य उपकरणों का उपयोग एवं महत्व।

निर्धारित पुस्तकें–

1. शैलीहवज्ञान –भोलानाथ तिवारी
2. प्रांरभिक शैलीविज्ञान – डॉ. चित्तरंजनकर
3. शैलीविज्ञान – सुरेश कुमार
4. हिन्दी भाषा–शिक्षण – रविन्द्रनाथ श्रीवास्तव एवं अन्य
5. भाषाशिक्षण – मनोरमा गुप्त

STATISTICS

PAPER-I

APPLIED STATISTICS

(Paper Code-0289)

UNIT-I Indian Applied Statistical System : Present official statistical system in India, Methods of collection of official statistics, their reliability and limitations, and the principal publications containing such statistics on the topics- population agriculture, industry, trade, price, labour and employment, transport and communications, banking and finance.

(15L)

UNIT-II Demographic Methods : Sources of demographic data - census, register, adhoc survey, hospital records, demographic profiles of Indian census. Measurement of mortality and life tables- crude, death rates, infant mortality rates, death date by cause, standardized death rate, complete life table - its main features, mortality rate and probability of dying, use of survival tables. Measurement of fertility - crude birth rate, general fertility rate, total fertility rate, gross reproduction rate, net reproduction rate.

(25L)

UNIT-III Economic Statistics : Index number - its definition, applications of index numbers. price relatives and quantity or volume relatives, link and chain relatives, problems involved in computation of index numbers, use of averages, simple aggregative and weighted average methods, Laspeyre's, Paasche's and Fisher's index numbers, time and factor reversal tests of index numbers. Consumer Price Index.

(20L)

UNIT-IV Static laws of demand and supply, price elasticity of demand, analysis of income and allied size distribution - Pareto distribution, graphical test, fitting of Pareto's law, log normal distribution and its properties, Lorenz curve and estimation of elasticity from time series data. Gini's coefficient.

UNIT-V Time Series Analysis: Economic time series, its different components, Illustrations, additive and multiplicative models, determination of trend, growth curves, analysis of seasonal fluctuations construction of seasonal indices.

(15L)

REFERENCES :

1. Croxton F.E. and Cowden D.J. (1969) : Applied General Statistics, Prentice Hall of India.
2. Goon, A.M., Gupta, M.K., Das gupta, B (1986) : Fundamentals of statistics, vol.-II, World Press, Calcutta.
3. Guide to Current Indian Offical Statistics : Central Statistical Organization, Govt. of India, New Delhi.
4. Saluja M.P. ( ) Indian Official statistical Systems, Statistical Publishing Society, Calcutta.
5. Srivastava, O.S. (1983): A textbook of Demography, Vikas Publishing.

ADDITIONAL REFERENCES:

1. Gupta and Mukhopadhyay P.P. ( ) Aplied Statistics, Central Book Agency.
2. Pressat R. (1978) : Statistical Demography, Methuen and Co. Ltd.

PAPER-II

STATISTICAL QUALITY CONTROL AND COMPUTATIONAL TECHNIQUES

(Paper Code-0290)

UNIT-I Importance of statistical methods in industrial research and practice, specification of items and lot qualities corresponding to visual gauging, count and measurements, types of inspection, determination of tolerance limits. General theory of control charts, causes of variation in quality, control limits, sub-grouping, summary of out-ot control criteria, charts for attributes, np chart, p - chatr, c- chart, u- chart, Charts for variables- X- and R charts, design of X and R charts versus p-charts, process capability studies.

(30L)

UNIT-II Principle of acceptance sampling- problem of lot acceptance, stipulation of good and bad lots, producer's and consumers risks, single and double sampling plans, their OC functions, concepts of AQL, LTPD, AOQL, average amount of inspection and ASN function, rectifying inspection plans, Sampling inspection plans, Indian Standards Tables Part-I (including applications), IS 2500 Part I.

(15L)

UNIT-III Computational techniques : Difference tables and methods of inferpolation, Newton's and Lagrange's methods of interpolation, Divided differences, numerical differentiation and integration, Trapezoidal rule, Simpson's one-third formula, iterative solution of non- linear equations.

(15L)

UNIT-IV Linear Programming : Elementary theory of convex sets, definition of general linear programming problems (LPP), formulation problems of LPP, examples of LPP, Problems occurring in various fields, graphical and Simplex method of solving an LPP, artificial variables, duality of LPP. Transportation Problem (non-degenerate and balanced cases only), Assignment Problem.

(30L)

UNIT-V Four short notes, one from each unit. Student have to answer any two.

REFERENCES :

1. Brownless K.A. (1960) : Statistical theory and Methodology in Science and Engineering. John Wiley and Sons.
2. Grant E.L. (1964) : Statistical Quality Control, McGraw Hill.
3. Duncan A.J. (1974) : Quality Control and Industrial Statistics, Traporewala and Sons.
4. Gass S.I. (1975) : Linear Programming Methods and Applications, McGraw Hill.
5. Rajaraman, V. (1981) : Computer Oriented Numerical Methods, Prentice Hall.
6. Sastry S.S. (1987) : Introductory Methods of Numerical Analysis, Prentice Hall.
7. Taha H.A. (1989) : Operations Research : An Introduction, Macmillan Publishing Company.

ADDITIONAL REFERENCES :

1. Bowker H.A. and Liberman G.T. (1962) : Engineering Statistics, Prentice Hall.
2. Cowden D.J. (1960) : Statistical Methods in Quality Control, Asia Publishing Society.
3. Garvin W.W. (1960) : Introduction to Linear Programming, McGraw Hill.
4. Mahajan M. (2001) : Statistical Quality Control, Dhanpat Rai & Co. (P) Ltd.
5. Rao S.S. (1984) : Optimization Theory and Applications, Wiley Eastern.
6. Krishnamurthy E.V. and Sen S.K. (1976) : Computer Based Numerical Algorithms, Affiliated East-West Press.

PRACTICAL

1. Computing measures of mortality & fertility, Construction of life tables and examples involving use of life tables, Graduation of mortality rates by Gompertz curve, fitting of a logistic curve.
2. Construction of Index Numbers by Laspeyre's, Paasche's, Fisher's method.
3. Determination of trend in a time series, construction of seasonal indices.
4. Fitting of Pareto curve to income data, Lorenz curve of concentration, Estimation of price elasticity of demand form time series data.
5. Drawing of X-R, np, p and c- charts. Drawing of OC curve for single and double sampling plans for attributes, AOQ and ATI curves.
6. Construction of difference tables, use of Newton's Lagrange's methods of interpolation and divided difference formulae, numerical evaluation of integrals using Trapezoidal and Simpson's one-third formulae, solution of non-linear equation by Newton-Raphson iterative method.
7. Formulation of LPP's and their duals. Solving LPPs by graphical and simplex methods, transportation and assignment problems.

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MATHEMATIS

TThere shall be three theory papers. Two compulsory and one optional Each paper carrying 50 marks is divided into five units and each unit carry equal marks.

PAPER - I

ANALYSIS

(Paper Code-0279)

REAL ANALYSIS

UNIT-I Series of arbitrary terms. Convergence, divergence and Oscillation. Abel's and Dirichlet's test. Multiplication of series. Double series.

Partial derivation and differentiability of real-valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem.

Fourier series. Fourier expansion of piecewise monotonic functions.

UNIT-II Riemann integral. Intergrability of continuous and monotonic functions. The fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Improper integrals and their convergence, Comparison tests. Abel's and Dirichlet's tests. Frullani's integral. Integral as a function of a parameter. Continuity, derivability and integrability of an integral of a function of a parameter.

COMPLEX ANALYSIS

UNIT-III Complex numbers as ordered pairs. Geometric representation of Complex numbers. Stereographic projection.

Continuity and differentiability of Complex functions. Analytic functions. Cauchy-Riemann equations. Harmonic functions.

Elementary functions. Mapping by elementary functions.

Mobius transformations. Fixedpoints, Cross ratio. Inverse points and critical mappings. Conformal mappings.

METRIC SPACES

UNIT-IV Definition and examples of metric spaces. Neighbourhoods, Limit points, Interior points, Open and closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, Construction of real numbers as the completion of the incomplete metric space of rationals. Real numbers as a complete ordered field.

UNIT-V Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, Isometry and homeomorphism. Equivalent metrics. Compactness,Sequential compactness. Totally bounded spaces. Finite intersection property. Continuous functions and compact sets, Connectedness, Components, Continuous functions and connected sets.

REFERENCES :

1. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. R.R. Goldberg, Real Analysis, Oxford & IBH publishing Co., New Delhi, 1970.
3. S. Lang, Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. Somasundaram and B. Choudhary, A First Coarse in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.
6. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
7. R.v. Churchill & J.W. Brown, Complex Variables and Applications, 5*" Edition, McGraw-Hill, NewYork, 1990.
8. MarkJ. Ablowitz & A.S.Fokas, Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998.
9. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
10. E.t. Copson, Metric Spaces, Cambridge University Press, 1968.
11. P.K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House, New Delhi, 1996.
12. G.F. Simmons, Inroductin to Topology and Modern Analysis, McGraw-Hill, 1963.

PART - II

ABSTRACT ALGEBRA

(Paper Code-0280)

UNIT-I Group-Automorphisms, inner automorphism. Automorphism groups and their computations, Conjugacy relation, Normaliser, Counting principle and the class equation of a finite group. Center for Group of prime-order, Abelianizing of a group and its universal property. Sylow's theorems, Sylow subgroup, Structure theorem for finite Abelian groups.

UNIT-II Ring theory-Ring homomorphism. Ideals and Quotient Rings. Field of Quotients of an Integral Domain, Euclidean Rings, Polynomial Rings, Polynomials over the Rational Field. The Eisenstien Criterion, Polynomial Rings over Commutative Rings, Unique factorization domain. R unique factorisation domain implies so is R [x1, x2 ..... xn] Modules, Submodules, Quotient modules, Homomorphism and Isomorphism theorems.

UNIT-III Definition and examples of vector spaces. Subspaces. Sum and direct sum of subspaces, Linear span. Linear dependence, independence and their basic properties. Basis. Finite dimensional vector spaces. Existence theoremfor bases. Invariance of the number of elements of a basis set. Dimension. Existence of complementary subspace of a subspace of a finite dimensional vector space. Dimension of sums of subspaces. Quotient space and its dimension.

UNIT-IV Linear transformations and their representation as matrices. The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space. Bidual space and natural isomorphism. Adjoint of a linear transformation. Eigenvalues and eigenvectors of a linear transformation. Diagonalisation. Annihilator of a subspace. Bilinear, Quadratic and Hermitian forms.

UNIT-V Inner Product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

REFERENCES :

1. I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
2. N. Jacobson, Basic Algebra, Vols. I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company).
3. Shanti Narayan, A Text Book of Modern Abstract Algebra, S.Chand & Co. New Delhi.
4. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Basic Abstract Algebra (2"" Edition) Cambridge University Press, Indian Edition, 1997.
6. K. Hoffman and R. Kunze,Linear Algebra, 2"" Editon, Prentice Hall. Englewood Cliffs, New Jersey, 1971.
7. S.K. Jain, A. Gunawardena & P.B. Bhattacharya, Basic Linear Algebra with MATLAB. Key College Publishing (Springer-Verlag) 2001.
8. S. Kumaresan, Linear Algebra, A.Geometric Approach, Prentice-Hall of India, 2000.
9. Vivek Sahai and Vikas Bist, Algebra, Norosa Publishing House, 1997.
10. I.S. Luther and I.B.S.Passi, Algebra, Vol. I-Groups, Vol. II-Rings. Narosa Publishing House (Vol. I-1996, Vol. II-1999)
11. D.S. Malik, J.N. Mordeson, and M.K. Sen, Fundamentals of Abstract Algebra, McGraw-Hill International Edition, 1997.

PAPER - III - (OPTIONAL)

(I) PRINCIPLES OF COMPUTER SCIENCE

(Paper Code-0281)

UNIT-I **Data Storage -** Storage of bits. Main Memory. Mass Storage. Coding Information of Storage. The Binary System. Storing integers, storing fractions, communication errors.

Data Manipulation - The Central Processing Unit. The Stored-Program Concept. Programme Execution. Other Architectures. Arithmetic/Logic Instructions. Computer-Peripheral Communication.

UNIT-II **Operating System and Networks -** The Evolutionof Operating System. Operating System Architecture. Coordinating the Machine's Activities. Handling Competition Among Process. Networks. Networks Protocol.

Software Engineering - The Software Engineering Discipline. The Software Life Cycle. Modularity. Development Tools and Techniques. Documentation. Software Ownership and Liability.

UNIT-III **Algorithms -** The Concept of an Algorithm, Algorithm Representation. Algorithm Discovery. Iterative Structures. Recursive Structures. Efficiency and Correctness.

(Algorithms to be implemented in C^{++}).

Programming Languages - Historical Perspective. Traditional Programming Concepts, Program Units. Language Implementation. Parallel Computing. Declarative Computing.

UNIT-IV **Data Structures -** Arrays. Lists. Stacks. Queues. Trees. Customised Data Types. Object Oriented Programming.

File Structure - Sequential Files. Text Files. Indexed Files. Hashed Files. The Role of The Operating System.

Database Structure - General Issues. The Layered Approach to Database Implementation. The Relational Model. Object-Oriented Database. Maintaining Database Integrity. E-R models.

UNIT-V **Artifical Intelligence -** Some Philosophical Issues. Image Analysis. Reasoning, Control System Activities. Using Heuristics. Artificial Neural Networks. Application of Artificial Intelligence.

Theory of Computation - Turning Machines. Computable functions. A Non computable Function. Complexity and its Measures. Problem Classification.

REFERENCES :

1. J. Glen Brookshear, Computer Science : An Overview, Addition -Wesley.
2. Stanley B. Lippman, Josee Lojoie, C^{++} Primer (3rd Edition), Addison-Wesley.

PAPER - III - (OPTIONAL)

(II) DISCRETE MATHEMATICS

(Paper Code-0282)

UNIT-I Sets and Propositions - Cardinality. Mathematical Induction, Principle of Inclusion and exclusion.

Computability and Formal Languages - Ordered Sets. Languages. Phrase Structure Grammars. Types of Grammars and Languages. Permutations. Combinations and Discrete Probability.

UNIT-II Relations and Functions - Binary Relations, Equivalence Relations and Partitions. Partial Order Relations and Lattices. Chains and Antichains. Pigeon Hole Principle.

Graphs and Planar Graphs - Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits. Shortest Paths. Eulerian Paths and Circuits. Travelling Salesman Problem. Planner Graphs.

TREES.

UNIT-III Finite State Machines - Equivalent Machines. Finite State Machines as Language Recognizers. Analysis of Algorithms - Time Complexity. Complexity of Problems. Discrete Numeric Functions and Generating Functions.

UNIT-IV1 Recurrence Relations and Recursive Algorithms - Linear Recurrence Relations with Constant Coefficients. Homogeneous Solutions. Particular Solution. Total Solution. Solution by the Method of Generating Functions. Brief review of Groups and Rings.

UNIT-V Boolean Algebras - Lattices and Algebraic Structures. Duality, Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Expressions. Prepositional Calculus. Design and Implementation of Digital Networks. Switching Circuits.

REFERENCES :

C.L. Liu, Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science Series, 1986.

PAPER - III - (OPTIONAL)

(III) APPLICATION OF MATHEMATICS IN FINANCE AND INSURANCE

(Paper Code-0283)

Application of Mathematics in Finance :

UNIT-I **Financial Management -** An overview. Nature and Scope of Financial Management. Goals of Financial Management and main decisions of financial management. Difference between risk, speculation and gambling.
Time value of Money-Interest rate and discount rate. Present value and future valuediscrete case as well as continuous compounding case. Annuities and its kinds.

UNIT-II Meaning of return. Return as Internal Rate of Return (IRR). Numerical Methods like Newton Raphson Method to calculate IRR. Measurement of returns under uncertainty situations. Meaning of risk. Difference between risk and uncertainty. Types of risks. Measurement of risk. Calculation of security and Portfolio Risk and Return-Markowitz Model. Sharpe's Single Index Model Systematic Risk and Unsystematic Risk.

UNIT-III Taylor series and Bond Valuation. Calculation of Duration and Convexity of bonds. Financial Derivaties - Futures. Forward. Swaps and Options. Call and Put Option. Call and Put Parity Theorem. Pricing of contingent claims through Arbitrage and Arbitrage Theorem.

Application of Mathematics in Insurance

UNIT-IV Insurance Fundamentals - Insurance defined. Meaning of loss. Chances of loss, peril, hazard, and proximate cause in insurance. Costs and benefits of insurance to the society and branches of insurance-life insurance and various types of general insurance. Insurable loss exposuresfeature of a loss that is ideal for insurance. Life Insurance Mathematics - Construction of Mortality Tables. Computation of Premium of Life Insurance for a fixed duration and for the whole life.

UNIT-V Determination of claims for General Insurance - Using Poisson Distribution and Negative Binomial Distribution-the Polya Case.
Determination of the amount of Claims in General Insurance - Compound Aggregate claim model and its properties, and claims of reinsurance. Calculation of a compound claim density function. F-recursive and approximate formulae for F.

REFERENCES :

1. Aswath Damodaran, Corporate Finance - Theory and Practice, John Wiley & Sons Inc.
2. John C. Hull, Options, Futures, and Other Derivatives, Prentice-Hall of Indian Private Limited.
3. Sheldon M. Ross, An Introduction to Mathematical Finance, Cambridge University Press.
4. Mark S. Dorfman, Introduction to Risk Management and Insurance, Prentice Hall, Englwood Cliffs, New Jersey.
5. C.D. Daykin, T. Pentikainen and M. Pesonen, Practical Risk Theoryfor Actuaries, Chapman & Hall.

PAPER - III - (OPTIONAL)

(Paper Code-0284)

Theory component will have maximum marks 30.

Practical component will have maximum marks 20.

(IV) PROGRAMMING IN C AND NUMERICAL ANALYSIS (Thoury & Practical)

Programming in C

UNIT-I Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays. Puppetting of strings. Structures. Pointers. File formatting.

Numerical Analysis

UNIT-II Solution of Equations : Bisection, Secant, Regula Falsi, Newton's Method, Roots of Polynomials : Interpolation : Lagrange and Hermite Interpolation, Divided Differences, Difference Schemes, Interpolation Formulasusing Differences. Numerical Differentiation.

Numerical Quadrature : Newton-Cote's Formulas. Gauss Quadrature Formulas, Chebychev's Formulas.

UNIT-III Linear Equations : Direct Methods for Solving. Systems of Linear Equations (Guass Elimination, LU Decomposition, Cholesky Decomposition), Iterative Methods (Jacobi, GaussSeidel, Relaxation Methods).

The Algebraic Eigenvalue problem : Jacobi's Method, Givens' Method, Householder's Method, Power Method, QR Method, Lanezos' Method.

UNIT-IV Ordinary Differential Equations : Euler Method, Single-step Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method, Methods Based on Numerical Integration, Methods Based on Numerical Differentiation, Boundary Value Problems, Eigenvalue Problems.

Approximation : Different Types of Approximation, Least Square Polynomial Approximation, Polynomial Approximation using Orthogonal Polynomials, Approximation with Trigonometric Functions, Exponential Functions, Chebychev Polynomials, Rational Functions.

Unit-V Monte Carlo Methods Random number generation, congruential generators, statistical tests of pseudo-random numbers.

Random variate generation, inverse tranform method, composition method, acceptancerejection method, generation of exponential, normal variates, binomial and Poisson variates.

Monte Carlo integration, hit or miss Monte Carlo integration, Monte Carlo integration for improper integrals, error analysis for Monte Carlo intergration.

REFERENCES :

1. Henry Mullish& Herbert L. Cooper, Spirit of C : An Introductionto Modern Programming, Jaico Publishers, Bombay.
2. B.W. Kernighan and D.M. Ritchie. The C Programming Language 2"d Edition, (ANSI features) Prentice Hall, 1989.
3. Peter A Darnel and Philip E. Margolis, C : A Software Engineering Approach, Narosa Publishing House, 1993.
4. Robert C. Hutehisonand Steven B. Just, Programming using C Language, McGraw Hill, 1988.
5. Les Hancock and Morris Krieger, The C Primer, McGraw Hill, 1988.
6. V. Rajaraman, Programming in C, Prentice Hall of India, 1994.
7. Byron S. Gottfried, Theory and Problems of Programming with C, tata McGraw-Hill Publishing Co. Ltd., 1998.
8. C.E. Froberg,Introduction to Numerical Analysis, (Second Edition), Addison-Wesley, 1979.
9. James B. Scarborough, Numerical Mathematical Anasysis, Oxford and IBHPublishing Co. Pvt. Ltd. 1966.
10. Melvin J. Maron, Numerical Analysis A Practical Approach, Macmillan publishing Co., Inc. New York, 1982.
11. M.K. Jain, 'S.R.K. lyengar, R.K. Jain, Numerical Methods Problems and Solutions, New Age International (P) Ltd., 1996.
12. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.
13. R.Y. Rubistein, Simulation and the Monte Carlo Methods, John Wiley, 1981.
14. D.J. Yakowitz Computational Probability and Simulation, Addison-Wesley, 1977.

PAPER - III - (OPTIONAL)

(V) MATHEMATICAL MODELLING

(Paper Code-0285)

The Process of Applied mathematics.

UNIT-I Setting up first-order differential equations - Qualitative solution sketching. Difference and differential equation growth models.

UNIT-II Single-species population models. Population growth-An age structure model. The spread of Technological innovation.

UNIT-III Higher-order linear models- A model for the detection of diabetes. Combat modes. Traffic models - Car-following models. Equilibrium speed distributions.

UNIT-IV Nonlinear population growth models. Prey-Predator models. Epidemic growth models. Models from political science - Proportional representation-cumulative voting, comparison voting.

UNIT-V Applications in Ecological and Environmental subject areas- Urban waste water management planning.

REFERENCES :

1. Differential equation models, Eds. Martin Braun, C.S. Coleman, D.A. Drew.
2. Political and Related Models, Steven. J. Brams, W.F. Lucas, P.D. Straftin (Eds.)
3. Discrete and System models, W.F. Lucas, F.S. Roberts, R.M. Thrall.
4. Life Science Models, H.M. Roberts & M. Thompson.
   All volumes published as modules in applied Mathematics, Springer-Verlag, 1982.
5. Mathematical Modelling by J.N. Kapur, New Age International, New Delhi.

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SOCIOLOGY

PAPER - I

SOCIOLOGY OF TRIBAL SOCIETY M.M. 75

(Paper Code-0246)

UNIT-I The concept of Tribe.

Characteristics of Tribal society Distinction in Tribe and Caste.

UNIT-II Classification of Tribal people :-

Food gatherers and hunters, shifting cultivates, nomads, peasants settled agriculturists, artisans.

UNIT-III Sociocultural profile - Kinship, marriage and family, religions beliefs cultural traditions.

UNIT-IV Social mobility and change sensitization.

Schemes of Tribal Development Various tribal movements.

UNIT-V Problems of Tribal people -

Poverty, illitracry, indebtedness, agrarian issues, exploitation study of tribal immunities in Chhattisgarh with special reference to "oraon", "Kanwar" and "Gond".

PAPER - II

SOCIAL RESEARCH METHODS M.M. 75

(Paper Code-0247)

UNIT-I Meaning and significance of Social Research.

Hypothesis and its formulation Scientific method and its applicability.

UNIT-II Positivism

Ethnography, observation, case study, content analysis.

Unit-III Types of Research -

Historical, descriptive, comparative exploratory, experimental.

UNIT-IV Techniques of data collection - survey sampling, Questionnaire, Interview schedule and Interview guide.

UNIT-V Meaning, importance and limitations of social statistics.

Graphs, diagrams and measures of central tendency - mean mode, mediaJ correlation.

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नृत्य (भारत नाट्यम)

इस विषय में दो सैद्धांतिक प्रश्न पत्र एक प्रायोगिक परीखा होगी। पूर्णांक एवं उत्तीर्णांक इस प्रकार होगें–

क्रं	विवरण	पूर्णांक	उत्तीर्णांक
1	सैद्धांतिक प्रश्न पत्र प्रथम	50	17
2	सैद्धांतिक प्रश्न पत्र द्वितीय	50	17
3	प्रायोगिक	50	17
	योग	**150**	**51**

विस्तृत पाठ्यक्रम – सैद्धांतिक
प्रथम प्रश्न पत्र
(पेपर कोड – 0287)

1. गुप्त काल में आधुनिक काल तक नृत्य का इतिहास
2. नृत्य का पराम्परागत परिवर्तन।
3. नृत्य विषय संबंधी निबंध।
4. नवरा विवरण।
5. भारतीय प्रेक्षागृहो की जानकारी (भरत नाट्यमशास्त्र के द्वितीय अध्ययन के अनुसार)

द्वितीय प्रश्न पत्र
(पेपर कोड – 0288)

1. ताण्डव और लाक्ष्य नृत्य का परिचय
2. (1) लेकधर्मी नाट्य परम्परा– किन्ही तीन की संक्षिप्त जानकारी – यक्षमान, कुचिपुड़ी, ... ओट्टनदुल्लन।
   (2) लोक नृत्य परिचय–
   (अ) कोलाट्टम,
   (ब) पिन्नल कोला पट्टम,
   (स) कोरतीकुम्मी,
   (द) कुचिपूड़ी,
   (इ) भांबड़ा (कोई भी चार)
3. नायक – नायिका भेद निरूपण।
4. भारतीय नृत्य में ताल का महत्व।
5. नृत्य कलाकारों की जीवनी–
   (1) रूक्मिणी देवी अरूण्डेल, (2) श्रीमति वाला सरस्वती,
   (3) श्री शंभू महाराज, (4) श्री लच्छू महाराज।
6. संक्षिप्त टिप्पणियां–
   (1) कीर्तनम्, (2) जावली, (3) वर्जम्,
   (4) तिल्लाना, (5) प्रलीकत्।

प्रायोगिक

1. मौखिक मुद्रा प्रदर्शन–
   (1) समस्त असंयुक्त हरत मुद्राओं का विनियोग एवं पांच संयुक्त हस्त..... विनियोग
   (2) जाति हस्त
   (3) दशावतार हस्त।
2. सप्ततालों का जाति के अनुसार प्रयोग।
3. देहाभ्यास – कूदना, झकना, अरमंडी (अर्धबैठक) मुरूमंडी, नऽय आदि।
4. अष्टपदी या कीर्तनम् पदम् या जावली का प्रदर्शन।

HOME SCIENCE

Paper - I

"HUMAN DEVELOPMENT"

(Paper Code-0253)

UNIT-I 1. Development-meaning of child growth and developement. Defferent aspects of gowth, principles of development, factors affecting child development, heredity and environment.

2. Stages of development -

1. Physiology of pregnancy
2. Prental
   - (a) Reproductive system
   - (b) Prenatal development
3. Infancy
   - (a) Early infancy
   - (b) Babyhood
4. Childhood
   - (a) Early childhood
   - (b) Late childhood
5. Adolescence
   - (a) Early adolescence
   - (b) Late adolescence

(i) Prental growth and development -

- (a) Sources of studing prenatal life
- (b) Stages of growth prenatal and development
- (c) Factors affecting prenatal and development growth
  - (1) Mother's food
  - (2) Health of mother
  - (3) Narcotics
  - (4) Age of parents
  - (5) Effect of season
  - (6) Emotion of mother

UNIT-2 1. Effect of normal and scissoring delivery.

2. Adjustment to new environment -
   - (a) Temperature
   - (b) Respiration
   - (c) Food consumption
   - (d) Excretion
3. Physical development of infant-
   - (a) Physical proportion
   - (b) Height
   - (c) Weight
   - (d) Pulse rate
   - (e) Respiration rate
   - (f) Body temperature
   - (g) Frequency of hunger.

4. Sensory development of infant
   (b) Light
   (c) Sound
   (d) Taste
   (e) Smell
   (f) Skin sensitivity
5. Motor activity of infants -
   (a) Mass activities
   (b) Specific activities -
      (i) Reflex activities
      (i) Advanages of reflex action
6. Emotions of infants -
   (a) Types of emotions
   (b) Significance of emotions
7. Characteristics of infant behaviour -
   (a) Dependancy
   (b) Individual difference
   (c) Adjustment

UNIT-3 Childhood : Adolescence.

1. Characterstics of this stage.
2. Factors affecting growth and development during childhood and adolescence.
3. Physical growth height, weight, body proportion, teeth
4. Growth and development of internal organs (a) Nervous (b) Mental (c) Circulatory system (d) Digestive system, (e) Respiratory system (f) Tissues and muscles systems.
5. Development of motor abilities (i) Types of motor abilities (ii) importance and characteristics of motor abilities in childhood (iii) Development of motor skills, Types of motor skills (iv) Delayed motor development.

UNIT-4 6. Development of emotional behaviour-characteristics special emotions (affection, anger, fear, jealousy and worries) factors affecting emotional behaviour.

7. Social developments stages - (a) during infancy, (b) nursery school period (c) elementory school period (d) Factor affecting social development.
8. Development of intelligence - Types according to throndyke, theories regarding intellegence.

UNIT-5 9. Play meaning of play, work and play, theories of play, characteristics of children's play, types of play, factors effecting play and importance of play.

10. Habits :
    1. Definition.
    2. Functions performed by habits.
    3. Habits and learning
    4. Laws of habit formation-identical to laws of learning.
    5. Habit formation.
       (a) Principles of habit formation.
       (b) Rules for habit formation.
11. Children delinquency-Types causes and remedial measures.

द्वितीय पेपर
आहार एवं पोषण विज्ञान
(पेपर कोड – 0254)

पुर्णांक– 50

यूनिट– 1 पोषक

1. पेषण की परिभाषा।
2. कार्यो के आधार पर पौष्टिक तत्वों का वर्गीकरण।
   (अ) उष्मा प्रउान करने वाले कार्बोज, वसा।
   (ब) शरीर का निर्माण करने वाले–प्रोटीन, खनिज तत्व ।
   (स) सुरक्षा व नियमन करने वाले जल, जीवन तत्व।
3. कार्बोज– परिभाषा, कार्य पाचन, अभिपोषण, चरापचय, रक्त शंर्करा स्तर व इसके नियतन अधिकता का प्रभाव प्राप्ति का साधन एवं दैनिक आवश्यकता।
4. वसा – परिभाषा, कार्य, वर्गीकरण, पाचन, अभिशोषण, चयानचय, संतृप्त व असंत्प्त वसीय अम्ल, आवश्यक वसीय अम्ल, कोलेस्टोरॉल कमी व अधिकता के प्रभाव एवं दैनिक आवश्यकता ।
5. प्रोटिन – परिभाषा, कार्य, वर्गीकरण, पाचन, अभिशोषण, चयानचय, नाइट्रोजन संतुलन, प्रोटिन का जैविक मूल्य, प्रोटिन का पूरक मूल्य, प्रोटीन व कैलोरी कुपोषण, प्राप्ति के साधन एवं दैनिक आवश्सकता।
6. खनिज तत्व– सामान्य वर्गीकरण व कार्य ,कार्य, अभिपोषण को प्रभावित करने वाले तत्व कमी व अधिकता के प्रभाव, साधन (कैलिशयम, फास्फोरस, लौहलवण, आयोडीन सोडियम, व क्लोराईड)
7. विटामिन्स – (जीवन तत्व) सामान्य वर्गीकरण व कार्य, कमी व अधिकता के प्रभाव, प्राप्ति के साधन, (जीवन सत्व ए.बी.सी.डी.ई. के)
8. जल– सामान्य कार्य, जल का संतुलन अधिकता के प्रभाव व निर्जलीकरण।

यूनिट– 1 आहार

1. आहार का वर्गीकरण व कार्य, आधारीय चार–भोज्य समूह व सात–भोज्य समूह
2. आनाज – प्रकार, रचना, संगठन, पकाने से पहले की प्रक्रिया – मौलिंग, पालिशिंग, पारवाईलिंग, फनोरिंग, पारचिंग, आनाज को उपयोग केरने के विभिन्न तरीके, आनाज–ताप, क्षार खमीरीकरण व ब्रीडिंग के प्रभाव।
3. दालें – प्रकार, संलग्र, अंकुरण, व खमीरीकरण के प्रभाव।
4. दुध – प्रकार, संगठन, दुध से बने पदार्थ – दही, मकखन, चीज आदि पाश्च्युराइलेशन एवम् होमोजीनाइजेशन ।
5. फल व सब्जियां – वर्गीकरण, संगठन, वर्णक, प्रोटीन का महत्व, परिपक्क होने की प्रक्रिया।
6. अण्डा – संगठन, पकाने का प्रभाव।
7. मांस मछली, पोल्ट्री – संगठन, पकाने से होने वाले परिवर्तन ।
8. शक्कर, गुड, शहद – संगठन, प्रकार, विधियों में उपयोग।
9. पेय पदार्थ – वर्गीकरण, पोषण की दृष्टि से महत्व, आत्यधिक उपयोग का प्रभाव।
10. मसाले – प्रकार, संगठन, पोषण की दृष्टि से महत्व ।

यूनिट– 3

1. खाद्य संरक्षण – उद्देश्य, विधियां, घेरलू संरक्षण, औद्योगिक संरक्षण।
2. खाद्य पदार्थो में सड़ंद – कारण, प्रकार, पहचान, उपचारात्मक विधिया।
    1. भोज्य विषाक्तता – कारण, प्रकार, पहचान, उपचारात्मक तरीकें।
    2. खाद्य मिलावट – आवश्यकता, प्रकार, महत्वपूर्ण मिलावटी पदार्थ, मिलावटी पदार्थो को पहचानने की सरल विधिया।
    3. टाहार, स्वास्थ्य व स्वच्छता – प्रकार, उपचारात्मक तरीके।
    4. खाद्य संग्रहण – आवश्यकता, प्रकार, उपयोग में होने वाले महत्वपूर्ण रसायन ।

यूनिट– 4 आहार नियोजन :

1. महत्व – आहार नियोजन के सिद्धांत प्रतिदिन की निर्धारित मात्रा (आर.टी.ए.), आहार आजोयन को प्रभावित करने वाले तत्व समय व शक्ति बचाने वाले आहार का आयोजन करना–
   (अ) पहले से योजना बनाना
   (ब) क्रय करने की योजना बनाना
   (स) सरल आहार तालिका
   आर्थिक स्तर के आधार पा आहार का आयोजन करना । चुनाव संग्रहण पूरक पदार्थो का उपयोग, बचे खाद्य पदार्थो का उपयोग।
2. शिशु विभिन्न आयु में पौष्टिक तत्वों च खाद्य पदार्थो की आवश्यता, आहार माता का दूध, फार्मूला फीडिंग।
3. बालाक का पोषण – आयु समूह की विशेषताएं, पौष्टिक तत्व एवे आहार को आवश्यकता, शालेय आहार कार्यक्रम–प्रकार, महत्व, कीमत, पोषण स्तर, आहारित व लवक्षण शरीर मापन विधियां।
4. गर्भावस्था व छात्रावस्था में पोषण – शारीरिक, पौष्टिक तत्वों की आश्यकता । असामान्य परिस्थितियां,
5. वृद्धावस्था में आहार एवम् पोषण – शारीरिक परिवर्तन, पौष्टिक तत्वों की आवश्यता । असामान्य स्थितियां।

यूनिट– 5 उपचारात्मक पोषण – परिभाषा

सामान्य आहार परिवर्तन – तरलता, पौष्टिक तत्व, गंध की उपस्थिति/अनुपस्थिति, कुछ खाद्य पदार्थो का सम्मिलित न करना ।

चयापचयी रोग–

1. मधुमेय – परिभाषा, लक्षण, कारण, इन्सुलेशन के प्रकार, आहार का प्रभाव, हाइपोग्लोसेकिक दवाईयां, मधुमेय में आसामान्य स्थितियां, मधुमेय व गर्भावस्था, मधुमेय व बाल्यावस्था ।
2. अधिक वनज/कम वनज – परिभाषा, कारण, उपचारात्मक तरीके, असामान्य स्थितियां।
   पौष्टिक तत्वों की कमी से होने वाले रोग–
   1. रक्तहीनता – प्रकार, कारण, पहचान, आहार।
   2. ए – विटामीनोसिस – प्रकार, कारण, आहार।
   3. प्राटिन कैलोरी कुपोषण – कारण, उपचारात्मक तरीके।
      रोग जिसमें आहारीय चिकित्सा सम्मिलित है–
   4. यकृत के रोग – प्रकार, कारण, आहार, (पौष्टिक तत्वों की आवश्यकता)

आमाशय के रोग–

1. पेप्टिक अल्सर – कारण, लक्षण, आहार (पौष्टिक तत्वों की आवश्यकता)
2. अपचन – कारण, पौष्टिक तत्वों की आवश्यकता।
3. अतिसार – प्रकार, कारण, आहार।
4. कब्ज – प्रकार, कारण, आहार।
5. उक्त रक्तचाप – कारण, आहार।

गृह विज्ञान
प्रायोगिक

पूर्णांक : 50

1. आनाज – दालें, अण्डा, दुध, मेवे, सब्जियां, फलो के उपयोग तैयार करना, हर भोज्य पदार्थ की कोई भी तीन पात्र विधियों के प्रायोगिक रिकार्ड बुक में लिखना। कैलोरी एवं प्रोटीन की गणना।
2. आहार आयोजन –
   (अ) गर्भावती महिला
   (ब) कब्ज की स्थिति
   (स) मधुमेह रोग
   (द) अधिक वनज की स्थिति
3. विभिन्न आर्थिक स्थिति में आहार योजनां
4. खाद्य संरक्षण कोई भी चार विधि से बनायी जाये।
5. सम्पूरक भोजन – आयोजन, गणना।
6. व्यतिव मापन विधि
7. बुद्धियापन विधि

प्रायोगिक परीक्षा अंको का विभाजन

सेशनल	**10**
योजना	**10**
तैयारी	**10**
गणना	**10**
मैखिक प्रश्न	**10**
कुल अंक	**50**

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Normal &Theropentic Nutrition.

1	C.H.Robinson	-	Normal &Therapetic Nutrition.
2	F.P.Antia	-	Clinical Nutrition &Dicterics.
3	M.Swaminathon	-	EssentialsofNutritionVol.I&II.
4	P.Rajalaxmi	-	AppliedNutrition.
5	C.Gopalan-etal	-	TheNutritionvalueofIndianFoods.ICHR.1991.
6	MangodeKonge	-	Normal&TherapenticNutrition (InHindi).
7	Jyotikulkarni	-	Normal&TherapenticNutrition.
8	GeetaPushpaShaw	-	
9	KreuseM.N.	-	FoodNutrition&DietTherapy.
10	आहार एवं पोषण	–	डॉ. अरूणा पल्टा, शिवा प्रकाशन, इन्दौर
11.	खाद्य परिक्षण	–	डॉ. अमिता सहगल, शिवा प्रकाशन, इदौर।

दर्शन शास्त्र :

बी.ए. भाग तीन दर्शन शास्त्र विषय में कुल दो प्रश्न पत्र होंगे तथा प्रत्येक में 75 अंक होंगे । प्रत्येक प्रश्न पत्र 5 इकाईयों में विभाजित है । प्रथम प्रश्नपत्र, 'तर्कशास्त्र' अनिवार्य है। द्वितीय प्रश्न पत्र में दों विकल्प दिये गये है –

1. ज्ञान मीमांस एवं तत्व मीमांस (भारतीय एवं पाश्चात्य)
2. ग्रीक दर्शन।

प्रश्न– पत्र प्रथम
तर्क शास्त्र (Logic)
(पेपर कोड – 0259)

इकाई– 1

1. तर्क शास्त्र – अर्थ, परिभाषा स्वरूप, उपयोगिता
2. आगमनात्मक एवं निगमनात्मक तर्क
3. तर्कदोषः आकास्मिक एवं अनाकारिक

इकाई– 2

1. सत्यता एवं वैधता
2. विचारों के नियम
3. प्रतिज्ञप्ति – वर्गीकरण, प्रतिज्ञप्ति की बुलीय व्याख्या
4. निरपेक्ष न्याय वाक्यों के मानक आकार एवं न्याय वाक्यों के परीक्षण हेतु वेन–रेका पद्धति

इकाई– 3

1. तार्किक संयोजन तथा कुछ महत्तवपूर्ण तार्किक संयोजन

(अ) संयोजन, (ब) निषेधक, (स) वियोजक, (द) आपादान, (इ) द्विआपादान तुल्यता

2. संयोजकों की अंतर्परिभाषिता
3. तार्किक युक्तियों की वैधता की परीक्षा के लिए सत्यता सारिणी विधि

इकाई–4

1. वैज्ञानिक व्याख्या की प्रकृति
2. वैज्ञानिक एवं अवैज्ञानिक व्याख्या में भेंद
3. विज्ञान एवं प्रकल्पणा

इकाई–5

1. न्याय – बौद्ध जैन दशैन में अनुमान की परिभाषा, अवयव एवं पक्षता
2. अनुमान के प्रकार
3. हेत्वाभास

अनुशंसित ग्रंथ–

1. रमाशंकर मिश्र – आधुनिक तर्कशास्त्र, एक परिचय
2. राज्य श्री अग्रवाल – तर्कशास्त्र
3. केदारनाथ – प्रतीकात्मक तर्कशास्त्र
4. ब्रजनारायण – अनुमान का विवेचन
5. बी.एन.सिंह – भारतीय दर्शन
6. डॉ. शोभा निगम – भारतीय दर्शन
7. Copi I. M. - Introduction of Lagic
8. S.C Chaattergjee - Nyaya Thoeory Knowledge
9. Choen & Negel - Introduction to Logic

प्रश्न – पत्र द्वितीय (वैकल्पिक)
(अ) ज्ञान मीमांस एवं मीमांस (भारतीय एवं पाश्चात्य)
(पेपर कोड–0260)

इकाई– 1 ज्ञान मीमांस एवं तत्व मीमांस : स्वरूप एवं विषय वस्तु
ज्ञान प्रमाण : प्रमा एवं अप्रमा

इकाई – 2 प्रामाण्य : स्वतः प्रामाण्य एवं परतः प्रामाण्य
ख्यातिवाद : सत्ख्यातिवाद, अख्यातिवाद, अन्यााि अनिवर्वनीय ख्यातिवाद

इकाई– 3

1. कारण का सिद्धांत (कारणकार्यवाद)

अ. सत्कार्यवाद : प्रकृति परिणामवाद, ब्रम्हा परिणामवाद, विवर्तवाद
ब. असत्कर्तवाद

2. सत्य के सिद्धांत

अ. संवादिता
ब. संसक्तता
स. अर्थक्रियावादी सिद्धांत

इकाई– 4

1. जड़वाद
2. अभ्यात्मवाद
3. वस्तुवाद

इकाई– 5

1. बुद्धिवाद
2. अनुभववाद
3. कांट का परीक्षावाद

अनुशंसित ग्रंथ :

1. दिवाकर पाठक एवं अविनाश श्रीवास्तव : भारतीय दर्शन की मूल समस्याएं
2. अर्जुन मिश्र : दर्शन की मूल धाराएं
3. डॉ. शोभा निगम : पाश्चात्य दर्शन के सम्प्रदाय
4. डॉ. शोभा निगम : भारतीय दर्शन
5. सुरेन्द्र वर्मा : भारतीय दर्शन
6. बंदिष्टे : भारतीय दर्शनिक निबंध
7. Patric : Introduction of Pholosophy
8. Chhaya Rai : Studies in Pilisophical methods
9. ब्रजगोपाल तिवारी : पाश्चात्य दर्शन

प्रश्न – पत्र द्वितीय (वैकल्पिक)
ग्रीक दर्शन
(पेपर कोडः 0261)

इकाई– 1 ग्रीक दर्शन : मुख्य विशेषताएं
माइलेशियन विचारक

1. थेलिस
2. एलेक्जिमेंडर
3. एनेक्जिमेनीज

इकाई– 2

1. हेराक्लाइट्स
2. जेनोफीनीज
3. पार्मेनाइनीज
4. जीनो

इकाई– 3

1. एम्पीडोक्लीज
2. एनेक्जागोरस
3. ल्यूगिपस
4. डेमोक्राइट्स

इकाई– 4

1. सोफिस्ट विचारक : प्रोटोगोरस, गार्जियस
2. सुकारात

इकाई– 5

1. प्लेटो
2. अरस्तू

अनुशंसित ग्रंथ :

1. जगदीश सहन श्रीवास्तव : ग्रीक एवं मध्ययुगीन दर्शन
2. शोभा निगम : ग्रीक एवं मध्ययुगीन दर्शन
3. नरेन्द्र तिवरी : ग्रीक दर्शन
4. रामनाथ शर्मा : पाश्चात्य दर्शन का इतिहास
5. Stace : Greek Philodphy
6. Burnet : Geek Philosophy
7. Gorpers : The Greek Thinkers

निसाब उर्दू अदब
पहला पर्चा
'नस्र' (पेपर कोड–0262) नं. 75
(दास्तान, ड्रामा, अफसाना)

निसाबः

दस्ताना :

1. किस्सा आजाद बख्त : इन्तेखाब बागोबहार मीर अमान।
2. मुलात मलकाए महन निगार : इन्तेखाब फसनए अजाइब रजब अली बेग शुरूर।

ड्रामा :

1. डाक्टर तयकीन की उलझन : अज इब्राहीम युसुफ
2. आगरा बाजार : अज हकीब तनवीर

अफसानाः

1. कफन : प्रेमचंद्र
2. नया कानून : सजादत हुसैन मन्टी
3. यूकिलिप्टस की हाली : कृष्ण चन्द्र
4. लाजवंती : राजेन्द्र सिंह वैदी
5. दो भीगे हुए लोग : इकबाल मजीद
6. झूठा संच/काठ का घोड़ा : रतन सिंह
7. छीमक : गयास अहमद गद्दी
8. अफसाना : जीलानी बानो

इकाईयां :

इकाई– 1 शामिले निसाब असनाप पर सवालात नं. 15
इकाई– 2 दास्तान निगारो पर सवालात नं. 15
इकाई– 3 ड्रामा निगारों पर सवालात नं. 15
इकाई– 4 अफसाना निगारों पर सवालात और अफसानों का खुलासा और जायजा नं. 15
इकाई– 5 दस्ताना और अफसानो से तशरीह नं. 15

दूसरा पर्चा (शायरी)
(पेपर कोड–0263)
(कसायूद, मरासी और मजमून निगारी) नं. 75

निसाबः

कसाइद :

1. फज्र होते जो गई आज मेरी आंख झपकअज सौदा देहलबी
2. सवन में दिया फिर महे शव्वाल दिखाईअज जौक देहलवी
3. स्मते काशी से जानिबे मथुरा बादल अज मोहसिन काकोरवी

मरासीः

1. किस शेर की आमद है के रन कॉफ रहा है अज दबीर (15 बंद)
2. ब खुदा फारसे मैदाने तहव्वूर या हुर अज अनील (15 बंद)

इकाईयां :

इकाई– 1 शामिले निसाब असनाफ पर सवालात नं. 15
इकाई– 2 कसोदा निगारों पर सवालात नं. 15
इकाई– 3 मर्तिया निगारों पर तन्कीदी सवालात नं. 15
इकाई –4 तशरीहजशारे कसाइद और गरासी नं. 20
इकाई– 5 अदबी माजू पर मजमून नं. 10

MANAGEMENT (प्रबंध)

PAPER - I

MONEY, BANKING TRADE & FOREIGN EXCHANGE M.M. : 75

(Paper Code-0269)

UNIT-I Difination of Money : Functions, impoertance & types Value of money, quantity theory. Cast transactions approach case balance approach & income approach.

UNIT-II Inflation : Cost push demand pull-effects of inflation and methods of control, deflation measures against deflation monetary standards gold and paper standards.

UNIT-III Banking types and their function : Credit creation & methods of control nationalisation of commercial books - R.B.I. and its functions financing.

UNIT-IV International and inter regional trade theory of comparative costs general equalibrium theory. Terms of trade, free trade versus protection. Dumping balance of trade and balance of payments.

UNIT-V Foreign exchange : Meaning, rate of exchange, its determination mint per theory, purchasing power parity theory Balance of payment theory Exchage control objects and methods of IMI.

BOOKS RECOMMENDED :

1. K.P.M. Sundram : Money, Banking & International Trade.
2. K.R. Gupta : International Economics.
3. Charies. P. : International Economics.
4. हरिशचंद्र शर्मा : मुद्रा एवं बैकिंग

PAPER - II

AUDITING, COSTING AND INCOME TAX M.M. : 75

(Paper Code-0270)

UNIT-I Principles of auditing :

Origin of Audit, the nature & definition of audit objects of audit, various class of audits and their advantages, audit under statute. The accounts of private firms, the audit of the accounts of private individuals the audit of the trust accounts.

UNIT-II Audit procedure and conduct of an audit :

Internal audit the qualities required of an auditor. Continuous and final or completed audit, consideration of the commencement of a new audit, audit note book methods of work.

UNIT-III The audit of cash transactions :

Audit of bank transections : Audit of petty of cash book : Audit of trading transctions. Internal check as regards cash, vouching, Internal check as regards wages. Audit of trading transaction : Purchases Purchases returns,. sales, sales returns, sales ledger.

UNIT-IV Fundamental of cost accountancy. Definition, Advantages, disadvantage and functions. Methods of cost accounting Unit costing. departmental costing. process costing. contract costing.; Elementary know ledger of Break even Analysis.

UNIT-V Income : tax on salary and capital gains, tax deduction at source, Rates of income tax and surcharge on income tax. Deduction in respect of C.P.F., L.I.C. premiums and commulative time deposits short term capital gains and long term capital gains deduction in respect of capital gains.

BOOKS RECOMMENDED :

1.	Agrawal & Khanuja	:	Cost Accounting
2.	Grewal & Shukla	:	Advanced Accounts
3.	Dr. R. R. Gupta	:	Cost Accounting
4.	D. N. Agarwal	:	The Higher Science of Accountancy.
5.	Bhagwati Prasad	:	Income Tax-Law & Practice
6.	Choudhary & Patel	:	Income Tax
7.	Dr. B. K. Agarwal	:	Income Tax
8.	Dr. S. M. Shukla	:	Auditing
9.	मेहरोत्रा	:	आयकर विधान एवं लेखे।

FUNCTIONAL ENGLISH

PAPER - I

C OMMUNICATION SKILL AND BROADCASTING M.M. 50

(Paper Code-0271)

.I Oral Communication

(1) Interview
(2) Dictation
(3) Meetings
(4) Seminars and Conference
(5) Group Discussion
(6) Audio Visual Aids

I. Writing Skill

(1) Business Corrsepondance.
(2) Agenda and Minutes.
(3) Advertising.
(4) Reports

III. **Broadcastin**g.

(1) Fundamentals, of Broadcasting
(2) Radio as a medium of Broadcasting.
(3) T.V. as a medium of Broadcasting.
(4) Current affairs of general Knowledge.

PAPER - II

ADVANCED GRAMMER

(Paper Code-0272)

Section A

(1) Constituent-
Students will be requised to devide each Sentence into its Constituent and label eachA,V,C,O, or E.
(2) Use of dynamic and stative verb :-
(3) Use of Adjective and Adverb :-
(4) use of Prepositions :-
(5) Question Tag :-
(6) Nodal verb :-
(7) Introducting word ‘it’ There ‘
(8) Use of Sentence in the Passive.

Section - B 20

(1) Use of Redio and its Sentance.
(2) Use & Function of T.V.
(3) Importance of Non Communication.
(4) Importance of News papers in the modern context.

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Dr. M. Chakraborty — Dr. S Gupta — DR. MERILY ROY

PRINCIPAL OF INSURANCE & PRACTICE

PAPER- I

PROPERTY AND LIABILITY INSURANCE **50 Marks**

(Paper Code-0273)

UNIT-I INTRODUCTION

Risk and Insurance; Insurable andnon-Insurable; Nature of Property and liability insurance, crop and cattle insurance, types of liability insurance reinsurance.

UNIT-II Basic concepts of Liability Insurance

(a) Basic concepts :- Specific and all risk insurance; valuation of risk; Indemnity contracts and specific value contracts; Average and contribution; Excess and short insurance careers.

(b) Liability Insurance:- Procedure for obtaining liability insurance. Legal position of insurance agent; construction and issue of policy; Records of liability insurance; policy conditions.

UNIT-III Types of liability Insurance policy-

Mandatory public Liability Insurance.

Dwelling Property losses; Business interruption and related losses, Theft Insurance contracts, Budgetory covers,m Auto Insurance,Medical Benefit Insurance; Dishon-esty, disappearance and destruction insurance; Employer's Liability; Aviation Insurance Personal and residential Insurance; Boiler Machinery insurance; commerical enterprises and industrial property insurance.

UNIT-IV Insurance Problems of Institutions

Insurance Problems of educational and religious institutions hospitals, clubs and assoriation; Professional package contracts; Errors and omissions insurance; professional liability insurance; Accountants liability insurance; Limits on amount of insurance Marketing and underwriting of liability insurance; Finance of liability insurance.

UNIT-V Adjustment of Losses and claims compensation:-

Nature of Losses and their adjustment: Procedure of adjustment Functions of adjuster's; Responsibilities of adjuster's; survey of losses; Procedure for preparing claims statements; Documents in use in claim settlements. Requirement of the insured in the event of loss. Apportionment and loss valuation; statutory control over liability insurance in India.

Liability policies by General Insurance Corporation of India.

PAPER - II

GROUP INSURANCE ANDRETIREMENT BENEFIT SCHEMES

(Paper Code-0274)

50 Marks

UNIT - I Introduction

Superannuation Schemes I
Superannuation Schemes II

UNIT-II Superannuation Schemes III

Gratuity Schemes

UNIT-III Group Life Insurance Schemes I

Group Life Insurance Schemes II

UNIT-IV Provident Fund & Employees Family, Pension and Deposit linked insurance Schemes.

Taxation Treatment of provisions for retirement Benefits-I

UNIT-V Taxation Treatment of Provisions for Retirement Benefits II

Group Schemes and Data Processing.

THEORY

HISTORY OF INDIAN PAINTING (Paper Code-0286)

(Bangal School to Modern age) **50 Marks**

Bangal School	-	Abanendra Nath Tagor
		Rabindra Nath Tagor
		Gaganendra Nath Tagor
		Nandalal Bose
Modern Age	-	Raja Ravi Varma
		Amrita Sher Gil
		Yamini Ray
Progresive Art Group		
Souza	-	M.F. Husain
		S.H. Raza
		N.S. Bendra
		K.K. Hebber

List of Book Recomended for theory :

- Bharatiya Chitrakala Ke Itihas - Shym Bihari Agrawal
- Kala Vilas - R.A. Agrawal

PRACTICAL

There will be two practical paper. Evalution will be made by the external and the internal examiners togather, and sessional marking is made by the class teacher.

The time of each paper is four hour's and there will be a half hour's recess in between.

PAPER - I

Copy from Indian meniature painting **Total Mark - 50**

Scheme of examination **Examination - 40**

Time - 4 Hours Sessional - 10

Paper - 1/4 Imp size

Medium - Water colour or poter colour

Sessional mark - 10

Minimum class work to be submitted five painting size 1/4 Imp paper Copying

from the Indian miniature painting style Mugal. Pahadi, Rajsthani.

PAPER - II

CREATIVE COMPOSITION

Scheme of examination — Total Mark - 50

Time Four hour's — Examination - 40

Size 1/2 Imp. paper — Sessional - 10

Medium - Water, Oil, acrylic or any

Sessional mark - 10

Minimum Class work to be submitted -

Five painting size 1/2 Imp.

Student will be experimented ith any media and form.

Above syllabus based on the syllabus of following Universities.

1. Vikram University, Ujjain
2. Rani Durgavati Vishwavidyalaya, Jabalpur.
3. Indira Kala Sangeet Vishwavidyalaya, Khairagarh.

DEFENCE STUDIES

PAPER-I

PROBLEMS OF WAR AND PEACE (Paper Code-0277)

Aim : The objective of this paper is to acquaint the students about the multidimensional problems of war and peace.

Note : Question will be set from each unit, there will be only internal choice.

Unit-I U.N.O. AND WORLD PEACE

1. Organs and its role.
2. Main specialized agencies of U.N.O.
3. Role of U.N.O. in world peace.
4. Peace keeping forces of the U.N.O.
5. Veto power and Security Council.

Unit-II WAR AND PEACE

1. Sattlement of International Disputes.
2. Diplomatic agents and Consuls.
3. War Crimes.
4. Neutrality.
5. Intervention.

Unit-III HUMANITARIAN LAW

1. Basic concepts and development of Humanitarian law.
2. UN General Assembly declaration of human rights on Dec. 10, 1948.
3. Protection of Victims and defenceless in armed conflict, POWs, wounded and civilians in Armed Forces.
4. Central Human Right Commission : Organisation and Function.
5. State Human Right Commission : Organisation and Function.

Unit-IV REFUGEE LAW

1. Meaning, Concept and causes of Refugee.
2. Refugee and IDPs.
3. Refugee law in India.
4. Refugee Problem in South Asia.
5. Role of International Committee of Red Cross and UNO in Refugee Problems.

Unit-V LAWS OF WAR

1. Law of Land war.
2. Law of Sea war.
3. Law of Air war.
4. Space law.
5. The International Court of Justice.

SELECTED READINGS :

1. Maunce clark, J:Readings in the Economics of War.
2. International Security : Modern political Science series.
3. Rajani Kothari : Word order.
4. Openhem, I : Use of Forces by states and International law.

PAPER - II

MODERN WARFARE (Paper Code-0278)

AIM : To enable students to appreciate the impact of Political, economic and technological developments on the patterns of conflicts between nations.

Note : Question will be set from each unit, there will be only internal choice.

UNIT-I
1. Development of Nuclear weapons.
2. Effects of Nuclear Explosion.
3. Spread of Nuclear Weapons.
4. Missile and their characteristics.
5. Type of Missiles.

UNIT-II
1. Trends in Science and Technology and their impact on war.
2. Role of Research and Development.
3. Development of Weapons and their impat on tactics
4. Command, Control, Communication and Intelligence (C^3 I) in Modern Warfare.
5. Elements of National Power.

UNIT-III
1. Military Satellites.
2. Explosive Bombs.
3. War Gases.
4. Micro Organs : as a weapons.
5. Smart Weapons.

UNIT-IV
1. Rocket Technology and India.
2. Missile Technology and India.
3. Nuclear Technology and India.
4. Atomic Minerals and India.
5. Space Technology and India.

UNIT-V
1. New word order - Political, Social and Economical.
2. Alliance and Regional co-operation.
3. Mobilisation of resources for war.
4. War time economics.
5. New trends.

SELECTED READINGS :

1.	Halailan Morton	:	Coutemporary Military strategy
2.	Brodue, Y.	:	Strategy in the Missile Age.
3.	Markabi, Y.	:	Nuclear war and Nuclear peace
4.	Osanka. F.M.	:	Modern Guerilla warfare
5.	Gerald. J.	:	Defence Psychology
6.	Know Kalus	:	Science and Defence
7.	Pandey Girish Kant	:	Yudh mein Vigyan avem Tackniki

PRACTICALS

There shall be practical examination of 3.5 hours duration carrying. 50 marks

The division of marks shall be as follows :

(1)	Plain Table Survey	:	15	Marks.
(2)	Experimental Military Psychology	:	15	Marks.
(3)	Group Descussion & Lectring	:	05	Marks.
(4)	Viva-Voce	:	05	Marks.
(5)	Sessional work & Record	:	10	Marks.

SECTION - A

Plain Table Survey by inter section methods.
(Ateast ten exercises in a session).

SECTION - B

Military psychology Experiment :

(1) Muller-Layer-IIlusion test.

(2) Koh's Block Design Test.

(3) Allexander Pass Along Test.

SECTION - C

Group Discussion and Lectures based on current topic on any international Problems as issue.

EDUCATION

PAPER - I

EDUCATIONAL MANAGEMENT AND EDUCATIONAL TECHNOLOGY

(Paper Code-0255)

COURSE OBJECTIVES

1. To develop knowledge and understanding of the meaning, scope process and types of management.
2. To develop the ability to identify the roles of participating members (individual or collective) and to plan various institutionalized managerial activities.
3. To develop the ability of making objective decisions in educational management.
4. To enable the students to understand about the concept, nature and acope of educational technology.
5. To expose the students to the basic developments in Educational Technology.

COURSE CONTENTS

UNIT-I - Concept of Educational Management : Meaning, nature, need and scope.

- Types of Educational Management : Centralized and decentralized, external and internal. Authoritarian / autocratic and democratic, dynamic / creative and Laissez-faire.

UNIT-II - Managerial Behaviour : Factors affecting managerial behaviours; personal, social, cultural, political, institutional etc.

- Aspects of institutional management : Curricular and co-curricular programmes; student welfare auxiliary services including school health services; school plant including equipment and assets; sanitation and beautification; institutional planning; time table; interpersonal relationship; institutional climate and discipline;

-

hostel and staff accommodation; management of finance; home, school and community relationships; evaluation of students achievement and promotion; admission, office management etc.

UNIT-III - Educational planning : Meaning, need and significance of educational planning; types of educational planning, strategies in educational planning; steps in educational planning.

UNIT-IV - Communication Process : theory, concept, nature, process, components, types of classroom communication, mass media approach in educational technology.

UNIT-V - System Approach to Instruction : System approach in instructional process, instructional system designing : concept, components, physical and human resources, steps.

- Innovations in Educational Technology : Programmed learning, micro and macro teaching, team teaching.
- Personalized system of instruction, computer assisted instruction, simulated teaching distance teaching.

BOOKS :

1. Educational Technology. R.A. Dhaowa, Lall Book Depot, Mearut.
2. शैक्षणिक तकनीकी आर. ए. वर्मा, लाल बुक डिपो मेरठ।

PAPER - II

PHILOSOPHY OF EDUCATIONAL

(Paper Code-0256)

UNIT-I - Naturatism

- Progmation

UNIT-II - Realism

- Ideatims

UNIT-III - Dayanand

- Gandhi
- Tagore

UNIT-IV - Aurbindo

- Vivekanand
- Azkir Hussan

UNIT-V - Montesson

- Froebel
- Festalloggi.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 1458 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

——00——

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर के निम्नलिखित कक्षा/विषय के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से स्नातक के तीनों वर्ष के लिए लागू किया जाता है।

1. बी.कॉम. – आधार पाठ्यक्रम–हिन्दी भाषा एवं वाणिज्य।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार

कुलसचिव

क्र. 1459 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 के परिपेक्ष्य में सूचनार्थ।
2. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

B.Com. - I

INDEX

1. Revised Ordinance No. 23
2. Scheme of Examination
3. Environmental Studies
3. Foundation Course
4. Financial Accounting
5. Business Communication
6. Business Maths
7. Business Reg. Framework
8. Business Environment
9. Business Economics
10. Computer Application

REVISED ORDINANCE NO.-23

(As per State U.G.C. Scheme)

BACHELOR OF COMMERCE

1. The three year course has been broken up into three Parts.

   Part-I known as B. Com. Part-I Examination at the end of first year. Part-II Examination at the end of the second year, and,
   Part-III Examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of Chhattisgarh Board of Secondary Education, Raipur or any other examination recognized by the University or Chhattisgarh Board of Secondary Education as equivalent there to has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year, shall be eligible for appearing at the B.Com. Part-I examination.

3. A candidate who after passing B.Com. Part-I examination of the University or any other examination recognized by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-II Examination.

4. A candidate who after passing B.Com. Part-II examination of the University has completed a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate students shall be eligible for admission to the examination as per provision of Ordinance No. 6 relating to examinations (General).

6. Provided that non-collegiate candidates shall be permitted to offer only such subject/ papers as are taught to the regular students at any of the University Teaching Department or College.

7. Every candidate for B.Com. Examination shall be examined in subjects as mentioned in the marking scheme and course or studies.

8. A candidate who has passed the B.Com. Part-III examination of the University shall be

allowed to present him of examination in any of the additional subjects prescribed for the B.Com. Examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B. Com. Part-I examination in the subject which he proposes to offer then the B.Com. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

9. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total marks in each paper/group of subjects. In group where both theory and practical examinations are provided an examinee must pass in both theory and practical parts of examination separately.

10. Candidate will have to pass separately at the Part-I, Part-II and Part-III examination. No division shall be assigned on the result of the Part-I and Part-II examinations In determining the division of the Final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part-I examination.

11. Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject/group only, the total aggregate mark being carried over for determining the division, shall include actual marks obtained in the subject/group in which he appeared at the supplementary examination.

12. Successful examinees at the Part - III examination obtaining 60% or more marks shall be placed in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

SYLLABUS

B.COM. PART-I

GROUPING OF SUBJECTS AND SCHEME OF EXAMINATION

Subject		Max.	Min.
i) **Environmental Studies** **Field Work**	**75** **25**	**100**	**33**
A. **Foundation Course** **I.** **Hindi Language** **II.** **English Language**		 **75** **75**	 **26** **26**
B. **Three Compulsory Groups**			
Group-I I. Financial Accounting II. Business Communication	**75** **75**	**150**	**50**
Group-II I. Business Mathematics II. Business Reg. Framework	**75** **75**	**150**	**50**
Group-III I. Business Environment II. Business Economics	**75** **75**	**150**	**50**

Part - I
SYLLABUS FOR ENVIRONMENTAL STUDIES AND HUMAN RIGHTS
(Paper code-0828)

MM. 75

इन्वारमेंटल साईंसेस के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है। स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न–पत्र उत्तीर्ण करना अनिवार्य है। तभी उपाधि प्रदाय योग्य होगी।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होंगे एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होंगे।

सैद्धांतिक प्रश्नों पर अंक – 75 (सभी प्रश्न इकाई आधार पर रहेंगे जिसमें विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक
(ब) निबंधात्मक – 50 अंक

Field Work – 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा। अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेंगे।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी। पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क के संयुक्त रूप से 33ः (तैंतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे।

UNIT-I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, Scope and

Importance Natural Resources:

Renewable and Nonrenewable Resources

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dam′s benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

(12 Lecture)

UNIT-II ECOSYSTEM

(a) Concept, Structure and Function of and ecosystem

- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristics Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecosystem.

(b) Biodiversity and its Conservation

- Introduction - Definition: genetic. species and ecosystem diversity
- Bio-geographical classification of India.
- Value of biodiversity: Consumptive use. Productive use, social ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.

- Hot spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

(12 Lecture)

UNIT- III

(a) Causes, effect and control measures of

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(12 Lecture)

(b) Environmental Management

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
- Wasteland reclamation
- Environment protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and Human Health.

UNIT- IV

General background and historical perspective- Historical development and concept of Human Rights, Meaning and definition of Human Rights, Kind and Classification of Human Rights. Protection of Human Rights under the UNO Charter, protection of Human Rights under the Universal Declaration of Human Rights, 1948. Convention on the Elimination of all forms of Discrimination against women. Convention on the Rights of the Child, 1989.

UNIT- V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State policy under the Constitution of India, Enforcement of Human Rights in India. Protection of Human Rights under the Human Rights Act, 1993- National Human Rights Commission, State Human Rights Commission and Human Rights court in India. Fundamental Duties under the Constitution of India.

Reference/ Books Recommended

1. SK Kapoor- Human rights under International Law and Indian Law.
2. HO Agrawal- Internation Law and Human Rights
3. एस.के. कपूर – मानव अधिकार
4. जे.एन. पान्डेय – भारत का संविधान
5. एम.डी. चतुर्वेदी –भारत का संविधान
6. J.N.Pandey - Constitutional Law of India
7. Agarwal K.C. 2001 Environmental Biology, Nidi pub. Ltd. Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin pub. Ltd. Ahmedabad 380013, India, Email: mapin@icenet.net(R)
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10. Clark R.S. Marine pollution, Clanderson press Oxford (TB)
11. Cuningham, W.P.Cooper. T.H.Gorhani, E & Hepworth. M.T,200
12. Dr. A.K.- Environmental Chemistry. Wiley Eastern Ltd.
13. Down to Earth, Center for Science and Environment (R)
14. Gloick, H.P. 1993 Water in crisis. pacific institute for studies in Deve. Environment & Security. Stockholm Eng. Institute. Oxford University, Press. m 473p.
15. Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Mumbai (R)

16. Heywood, V.H. & Watson, T.T.1995 Global Biodiversity Assessment, Cambridge Univ. Press 1140p
17. Jadhav H. & Bhosale, V.H. 1995 Environmental Protection and Law. Himalaya pub. House, Delhi 284p
18. Mckinney M.L.& School R.M.1996, environmental Science systems & solutions, web enhanced edition, 639p
19. Mhadkar A.K. Matter Hazardous, Techno-Science publication(TB)
20. Miller T.G.Jr. Environment Science, Wadsworth publication co. (TB)
21. Odum E.P.1971, Fundamentals of Ecology, W.B. Saunders Co. USA,574p
22. Rao M.N. & Datta, A.K. 1987, Waste water treatment. Oxford & IBH pub.co.pvt. Ltd 345p
23. Sharma B.K. 2001, Environmental chemistry, Goel pub. House, Meerut
24. Survey of the Environment, The Hidu(M)
25. Townsend C. Harper J. And Michael Begon, Essentials of Ecology, Blackwell Science(TB)
26. Trivedi R.K.Handbook of Environment Laws, Rules, Guidlines, Compliances and Standards, Vol land II, Environment Media(R)
27. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science publication (TB)
28. Wanger K.D.1998, Environmental Management. W.B. Saunders Co. Philadelphia, USA 499

संशोधित पाठ्यक्रम

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.

भाग – एक (आधार पाठ्यक्रम)

प्रश्न पत्र– प्रथम (हिन्दी भाषा)

(पेपर कोड –0101) पूर्णांक– 75

नोट :–

1. प्रश्न पत्र 75 अंक का होगा।
2. प्रश्न पत्र अनिवार्य होगा ।
3. इसके अंक श्रेणी निर्धारण के लिए जोड़े जायेंगे।
4. प्रत्येक इकाई के अंक समान होंगे।

पाठ्य विषय :–

इकाई–1

क. पल्लवन, पत्राचार, अनुवाद, पारिभाषिक शब्दावली एवं हिंदी में पदनाम

ख. ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई–2

क. शब्द शुद्धि, वाक्य शुद्धि, शब्द ज्ञान–पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द एवं मुहावरे–लोकोक्तियाँ

ख. भारत वंदना (कविता)– सूर्यकान्त त्रिपाठी निराला

इकाई–3

क. देवनागरी लिपि – नामकरण, स्वरूप एवं देवनागरी लिपि की विशेषताएँ, हिंदी अपठित गद्यांश, संक्षेपण, हिंदी में संक्षिप्तीकरण

ख. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई

इकाई–4

क. कम्प्यूटर का परिचय एवं कम्प्यूटर में हिंदी का अनुप्रयोग

ख. शिकागो से स्वामी विवेकानंद का पत्र

इकाई–5

क. मानक हिन्दी भाषा का अर्थ, स्वरूप, विशेषताएँ, मानक, उपमानक, अमानक भाषा

ख. सामाजिक गतिशीलता – प्राचीन काल, मध्यकाल, आधुनिक काल

मूल्यांकन योजना :–

प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 होंगे। प्रश्न–पत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य :–

व्याकरण के बुनियादी ज्ञान, संप्रेषण, कौशल, सामाजिक संदेश एवं भाषायी दक्षता को ध्यान में रखते हुए यह पाठ्यक्रम प्रस्तावित है।

FOUNDATION COURSE

PAPER - II

ENGLISH LANGUAGE (Paper Code-0102) M.M. 75

UNIT-1 **Basic Language skills : Grammar and Usage.**

Grammar and Vocabulary based on the prescribed text. To be assessed by objective / multiple choice tests.

(Grammar - 20 Marks
Vocabulary - 15 Marks)

UNIT-2 **Comprehension of an unseen passage.** 05

This should simply not only (a) an understanding of the passage in question, but also

(b) a grasp of general language skills and issues with reference to words and usage

within the passage and (c) the Power of short independent composition based on themes and issues raised in the passage.

To be assessed by both objective multiple choice and short answer type tests.

UNIT-3 **Composition :** Paragraph writing 10

UNIT-4 **Letter writing** (The formal and one Informal) **10**

Two letters to be attempted of 5 marks each. One formal and one informal.

UNIT-5 Texts : **15**

Short prose pieces (Fiction and not fiction) short poems, the pieces should cover a range of authors, subjects and contexts. With poetry if may sometimes be advisable to include pieces from earlier periods, which are often simpler than modern examples. In all cases, the language should be accessible (with a minimum of explanation and reference to standard dictionaries) to the general body of students schooled in the medium of an Indian language.

Students should be able to grasp the contents of each place; explain specific words, phrases and allusions; and comment on general points of narrative or argument. Formal Principles of Literary criticism should not be taken up at this stage.

To be assessed by five short answers of three marks each.

BOOKS PRESCRIBED -

English Language and Indian Culture - Published by M.P. Hindi Grant Academy Bhopal.

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

B. Com Part- I

Compulsory

Group – I Paper – I - Financial Accounting

OBJECTIVE – To Impart basic accounting knowledge as applicable to business.

UNIT –I

Accounting**:** An Introduction: Development, Definition, Needs, objectives; Branches of accounting; Basic Accounting Principles, Concepts & Conventions.

Accounting Standard: International Accounting Standard only outlines, Accounting Standard in India.

Accounting Transaction: Concept of Double Entry System, Concept of Capital & Revenue, Book of original records: Journal; Ledger; Sub-Division of Journal: Cashbook.

UNIT –II

Final Accounts; Trial balance; Manufacturing account; Trading account; Profit & loss account; Balance sheet; Adjustment entries.

Rectification of errors; Classification of errors; Location of errors; Rectification of errors; Suspense account; Effect on profit.

UNIT –III

Depreciation, Provisions, and Reserves; Concept of depreciation; Causes of deprecation; Depreciation, depletion amortization, Depreciation accounting; Methods of recording depreciation; Methods for providing depreciation; Depreciation of different assets; Depreciation of Replacement cost; Depreciation policy; as per Indian accounting Standard : provisions and Reserves. Accounts of Non-Trading Institutions.

UNIT –IV

Special Accounting Areas :

Hire-purchase and installment purchase system: Meaning of hire-purchase contract, Legal provision regarding hire-purchase contract; Accounting for goods of substantial sale values, and accounting records for goods for small values ; Installment purchase system ; After sales Service.

UNIT –V

Partnership Account: Dissolution of a Partnership Firm, Amalgamation of Partnership Firms, Conversion of Partnership Firm into Joint Stock Company.

Suggested Readings:

1. Gupta, R.L. and Radhaswamy. M; Financial Accounting; Sultan Chand and Sons, New Delhi. (Both Hindi and English medium)
2. Monga J.R. Ahuja Girish, and Sehgal Ashok: Financial Accounting; Mayur Paper Back, Noida.
3. Shukla. M.C., Grewal T.S. and Gupta, S.C.: Advanced Accounts; S. Chand & Co. New delhi.
4. Singh B.K.; Financial Accounting; Wisdom Publishing House, Varanasi.
5. S.M. Shukla; Financial Accounting; Sahitya Bhawan Publication; Agra. (Both Hindi and English medium)
6. Karim & Khanuja; Financial Accounting; SBPD Publishing House; Agra. (Both Hindi and English medium)
7. Agrawal & Mangal; Financial Accounting; Universal Publication. (Both Hindi and English medium)

बी.कॉम. भाग – एक

अनिवार्य

समूह–1 प्रश्नपत्र – 1 – वित्तीय लेखांकन

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 लेखांकन का अर्थ एवं क्षेत्र : आवश्यकता, विकास एवं परिभाषा, लेखांकन के उद्देश्य, पुस्तपालन एवं लेखांकन में अन्तर, लेखांकन की शाखाएं। लेखांकन सिद्धांत, लेखांकन मानक : अन्तर्राष्ट्रीय लेखांकन मानक (सिर्फ रूपरेखा) : भारत में लेखांकन मानक। लेखांकन व्यवहार : लेखांकन चक्र : पंजी (जर्नल) : डेबिट (विकलन) एवं क्रेडिट (समाकलन) के नियम, संयुक्त पंजी (जर्नल) प्रविष्टि, प्रारम्भिक प्रविष्टि : जर्नल एवं खाताबाही में सम्बन्ध, पूँजी एवं आगम : आय, व्यय एवं प्राप्तियों का वर्गीकरण।	**इकाई – 1** लेखांकन का परिचय : विकास, परिभाषा, आवश्यकता, उद्देश्य, लेखांकन की शाखाएं; लेखांकन के सिद्धांत, अवधारणा एवं परंपराएं। लेखांकन मानक : अन्तर्राष्ट्रीय लेखांकन मानक (सिर्फ रूपरेखा) : भारत में लेखांकन मानक। लेखांकन व्यवहार; दोहरी प्रविष्टि प्रणाली की अवधारणा। पूँजी एवं आगम की अवधारणा, मूल प्रविष्टि की पुस्तकें: जर्नल, खाताबही, जर्नल का विभाजन : रोकड़ पुस्तक ।
इकाई – 2 तलपट , अन्तिम खाते : निर्माणी खाता, व्यापार खाता, लाभ–हानि खाता, चिट्ठा एवं समायोजन प्रविष्टियॉं। अशुद्धियों का सुधार या संशोधन, अशुद्धियों का वर्गीकरण, अशुद्धियों की स्थिति, अशुद्धियों का सुधार, उचंत खाता लाभ पर प्रभाव।	**इकाई – 2** तलपट, अन्तिम खाते : निर्माणी खाता, व्यापार खाता, लाभ–हानि खाता, चिट्ठा एवं समायोजन प्रविष्टियॉं। अशुद्धियों का सुधार या संशोधन, अशुद्धियों का वर्गीकरण, अशुद्धियों की स्थिति, अशुद्धियों का सुधार, उचंत खाता लाभ पर प्रभाव।
इकाई – 3 मूल्य ह्रास (अवक्षयण), आयोजन एवं संचय; ह्रास की अवधारणा , ह्रास के कारण, ह्रास रिक्तता, अपलेखन ह्रास लेखांकन, ह्रास अभिलेखन की विधियाँ; विभिन्न सम्पत्तियों पर ह्रास आयोजन की विधियाँ; प्रतिस्थापन लागत पर ह्रास, भारतीय लेखांकन मानक के अनुसार लेखांकन नीतियाँ, आयोजन एवं संचय; गैर–व्यापारिक संस्थाओं के खाते।	**इकाई – 3** मूल्य ह्रास (अवक्षयण), आयोजन एवं संचय; ह्रास की अवधारणा , ह्रास के कारण, ह्रास रिक्तता, अपलेखन ह्रास लेखांकन, ह्रास अभिलेखन की विधियाँ; विभिन्न सम्पत्तियों पर ह्रास आयोजन की विधियाँ; प्रतिस्थापन लागत पर ह्रास, भारतीय लेखांकन मानक के अनुसार लेखांकन नीतियाँ, आयोजन एवं संचय; गैर–व्यापारिक संस्थाओं के खाते।
इकाई – 4 विशेष लेखांकन क्षेत्रः (क) शाखा खाते : आश्रित शाखा, देनदार पद्धति , स्कन्ध एवं देनदार पद्धतिं। (ख) किराया क्रय एवं किस्त क्रय पद्धति : किराया क्रय अनुबन्ध का अर्थ, किराया क्रय अनुबन्ध संबंधित प्रॉवधान, अधिक मूल्य की वस्तुओं के लिए लेखांकन अभिलेख , किस्त क्रय पद्धति एवं क्रय पश्चात् सेवा।	**इकाई – 4** विशेष लेखांकन क्षेत्रः किराया क्रय एवं किस्त क्रय पद्धति : किराया क्रय अनुबन्ध का अर्थ, किराया क्रय अनुबन्ध संबंधित प्रॉवधान, अधिक मूल्य की वस्तुओं के लिए लेखांकन अभिलेख , किस्त क्रय पद्धति एवं क्रय पश्चात्

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वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 5 (क) साझेदारी खाते : साझेदारी की सारभूत विशेषताएँ, साझेदारी संलेख ; अन्तिम खाते , खाते बंद होने के पश्चात् समायोजन; स्थिर एवं परिवर्तनशील पूँजी, ख्याति–लेखांकन मानक 10 संयुक्त जीवन बीमा पॉलिसी, लाभ विभाजन अनुपात में परिवर्तन, (ख) साझेदारी फर्म का पुनर्निर्माण; फर्म में साझेदार का प्रवेश; साझेदार का अवकाश ग्रहण;साझेदार की मृत्यु, फर्म का विघटन, लेखांकन प्रविष्टियाँ, साझेदारी फर्म का दिवालिया होना, फर्म के विघटन की विधियाँ, लेखांकन प्रविष्टियाँ, साझेदार का दिवलिया होना, वितरण ।	**इकाई – 5** साझेदारी खाते : साझेदारी फर्म का विघटन, साझेदारी फर्मो का एकीकरण, साझेदारी फर्म की संयुक्त स्कन्ध प्रमण्डल में परिवर्तन।

Suggested Readings:

1. Gupta, R.L. and Radhaswamy. M; Financial Accounting; Sultan Chand and Sons, New Delhi. (Both Hindi and English medium)
2. Monga J.R. Ahuja Girish, and Sehgal Ashok: Financial Accounting; Mayur Paper Back, Noida.
3. Shukla. M.C., Grewal T.S. and Gupta, S.C. : Advanced Accounts; S. Chand & Co.. New delhi.
4. Singh B.K.; Financial Accounting; Wisdom Publishing House, Varanasi.
5. S.M. Shukla; Financial Accounting; Sahitya Bhawan Publication; Agra. (Both Hindi and English medium)
6. Karim & Khanuja; Financial Accounting; SBPD Publishing House; Agra. (Both Hindi and English medium)
7. Agrawal & Mangal; Financial Accounting; Universal Publication. (Both Hindi and English medium)

B.Com Part- I

Compulsory

Group – I Paper – II - BUSINESS COMMUNICATION

Proposed Syllabus

OBJECTIVE – To develop effective business communication skills among the students.

UNIT –I

Introducing Business Communication: Definitions, concept and Significance of communication, Basic forms of communicating; Communication models and process; principles of effective communication; Theories of communication;

Self-Development and Communication; Development of positive personal attitudes, SWOT analysis.

UNIT –II

Corporate Communication: Formal and Informal communication networks; Grapevine; Miscommunication (Barriers); improving communication. Practices in business communication; Group discussions; Seminars; Effective Listening: Principles of effective listening; Factor affective listening exercises; Oral, Written, and video session, Audience analysis and feedback.

UNIT –III

Writing skill: Business letters – Defination, concepts, structure, advantages disadvantage, need and kinds of business letter, Essentials of effective business letter. Good news and bad new letters; Office memorandum. Writing Resume and Letter of Job Application.

UNIT –IV

Report Writing: Introduction to a proposal, Short report and formal report, report preparation.

Oral Presentation: Principles of oral presentation, factor affecting presentation, sales presentation, training presentation, conducting surveys, speeches to motivate, presentation skill.

UNIT –V

Non-Verbal Aspects of Communicating. Body Language: Kinesics, Proxemics, Para Language.

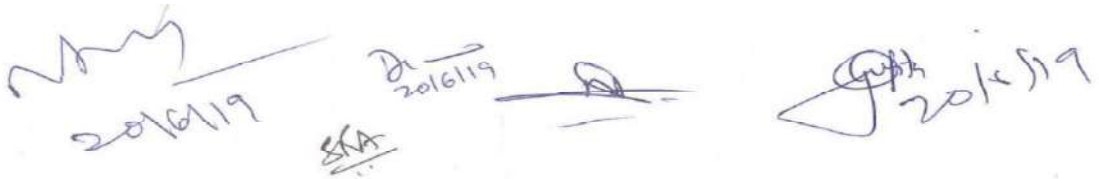
Interviewing skills: Appearing in interviews; conducting interviews; mock interview.

Modern Forms of Communicating: Fax; E-Mail; video conferencing; etc.

International Communication for global business.

Suggested Readings:

1. Dr. P. K. Agrawal, Dr. A.K. Mishra ; Business Communication ; Sahitya Bhawan Publication; Agra (Hindi medium)
2. Balasubramanyam: Business Communication; Vikas Publishing House, Delhi. (English medium)
3. Dr. Vinod Mishra: Business Communication; Sahitya Bhawan Publication; Agra. (Hindi medium)
4. Kaul: Effective Business Communication; Prentice Hall, New Delhi. (English medium).
5. Patri VR: Essentials of Communication; Greenspan Publications, New Delhi. (English medium)
6. Senguin J: Business Communication; The Real World and Your Career, Allied Publishers, New Delhi. (English medium)
7. Dr. Mishra, Shukla & Patel; Business Communication; SBPD Publishing House, Agra. (Both Hindi and English medium)



बी.कॉम. भाग – एक
अनिवार्य
समूह–1 प्रश्नपत्र – 2 – व्यावसायिक संचार

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 व्यावसायिक संचार परिचयः परिभाषा , अवधारणाएं एवं संचार का महत्व, संचार के आधारभूत प्रकार एवं मॉडल एवं प्रभावी संचार के सिद्धांत, प्रक्रिया , श्रोता विश्लेषण। आत्म विकास एवं संचार, सकारात्मक व्यक्तिगत दृष्टिकोण का विकास, स्वॉट विश्लेषण, मतो की परस्पर निर्भरता का प्रतिरूप।	**इकाई – 1** व्यावसायिक संचार परिचय : परिभाषा , अवधारणाएं एवं संचार का महत्व, संचार के आधारभूत प्रकार एवं मॉडल, प्रक्रिया एवं प्रभावी संचार के सिद्धांत । आत्म विकास एवं संचार , सकारात्मक व्यक्तिगत दृष्टिकोण का विकास , स्वॉट विश्लेषण ।
इकाई – 2 व्यावसायिक संस्था का संचार तंत्रः– औपचारिक एवं अनौपचारिक संचार तंत्र, अंगूरी लता संचार, संचार की बाधाएं एवं सुधार। व्यवहार में व्यावसायिक संचारः– सामूहिक परिचर्चा, साक्षात्कार, संगोष्ठी, प्रभावपूर्ण सूनना, व्यक्तिगत एवं सामुहिक प्रस्तुतीकरण एवं रिर्पोट लेखन।	**इकाई – 2** व्यावसायिक संस्था का संचार तंत्रः– औपचारिक एवं अनौपचारिक संचार तंत्र, अंगूरी लता संचार, संचार की बाधाएं एवं सुधार। व्यवहार में व्यावसायिक संचारः– सामूहिक परिचर्चा, संगोष्ठी , प्रभावपूर्ण सूनना : प्रभावपूर्ण सूनने के सिद्धांत, प्रभावपूर्ण सूनने के कारक, मौखिक , लिखित एवं विडियो सत्र का व्यवहारिक अध्ययन, श्रोता विश्लेषण एवं प्रतिपुष्टी।
इकाई – 3 लेखन कुशलता : व्यावसायिक संदेश की योजना एवं उसे संशोधित करना, प्रथम मसौदा, अंतिम मसौदा का पुनर्निर्माण, व्यावसायिक पत्र एवं ज्ञापन, प्रारूपः निवेदन पत्र , अनुकुल एवं प्रतिकुल संवाद पत्र, प्रेरक पत्र, विक्रय संबंधी पत्र, तकादे का पत्र या संग्रहण पत्र, कार्यालयीन ज्ञापन व पत्र।	**इकाई – 3** लेखन कुशलता : व्यावसायिक पत्र – परिभाषा, अवधारणा, संरचना, गुण दोष , आवश्यकता एवं विभिन्न प्रकार के व्यावसायिक पत्र , प्रभावी व्यापारिक पत्र व्यवहार के मूल तत्व। अनुकुल एवं प्रतिकुल संवाद पत्र, कार्यालयीन ज्ञापन व पत्र । जीवनवृत लेखन एवं नौकरी के लिए आवेदन पत्र।
इकाई – 4 रिर्पोट लेखन – एक प्रस्ताव का परिचय, लघु रिर्पोट एवं औपचारिक रिर्पोट ,रिर्पोट लेखन की तैयारी। मौखिक प्रस्तुतीः मौखिक प्रस्तुती के सिद्धांत , प्रस्तुतीकरण को प्रभावित करने वाले कारक, विक्रय प्रस्तुतीकरण , प्रशिक्षण प्रस्तुतीकरण, सर्वेक्षण आयोजित करना, प्रेरक भाषण, प्रभावी प्रस्तुती कौशल।	**इकाई – 4** रिर्पोट लेखन – एक प्रस्ताव का परिचय , लघु रिर्पोट एवं औपचारिक रिर्पोट ,रिर्पोट लेखन की तैयारी। मौखिक प्रस्तुती : मौखिक प्रस्तुती के सिद्धांत , प्रस्तुतीकरण को प्रभावित करने वाले कारक, विक्रय प्रस्तुतीकरण , प्रशिक्षण प्रस्तुतीकरण, सर्वेक्षण आयोजित करना, प्रेरक भाषण, प्रभावी प्रस्तुती कौशल।
इकाई – 5 अशाब्दिक संचार के पहलू – दैहिक भाषा : समय एवं पार्श्व भाषा , प्रभावपूर्ण सूनना : प्रभावपूर्ण सूनने के सिद्धांत,	**इकाई – 5** अशाब्दिक संचार के पहलू – दैहिक भाषा , समय एवं पार्श्व भाषा ,

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प्रभावपूर्ण सूनने के कारक, मौखिक , लिखित एवं विडियो सत्र का व्यवहारिक अध्ययन। साक्षात्कार कुशलता : साक्षात्कार में शामिल होना, साक्षात्कार का आयोजन, जीवनवृत – सारांश लेखन एवं आवेदन पत्र। संचार के आधुनिक रूप – फैक्स, ई मेल, वीडियो कॉन्फ्रेसिंग आदि अंतराष्ट्रीय संचारः सांस्कृतिक संवेदनशीलता एवं सांस्कृतिक संदर्भ, अंतराष्ट्रीय स्थितियों मे लेखन और प्रस्तुतीकरण करनाः अंतराष्ट्रीय क्रियाओं में अंतराष्ट्रीय सांस्कृतिक कारक, वैश्विक व्यापार के संदर्भ में।	साक्षात्कार कुशलता : साक्षात्कार में शामिल होना, साक्षात्कार का आयोजन, मॉक साक्षात्कार। संचार के आधुनिक रूप – फैक्स , ई मेल, वीडियो कॉन्फ्रेसिंग आदि अंतराष्ट्रीय संचार : सांस्कृतिक संवेदनशीलता एवं सांस्कृतिक संदर्भ , भूमण्डलीय व्यावसाय के लिए अंतराष्ट्रीय संप्रेषण।

Suggested Readings:

1. Dr. P. K. Agrawal, Dr. A.K. Mishra ; Business Communication ; Sahitya Bhawan Publication; Agra (Hindi medium)
2. Balasubramanyam: Business Communication; Vikas Publishing House, Delhi. (English medium)
3. Dr. Vinod Mishra: Business Communication; Sahitya Bhawan Publication; Agra. (Hindi medium)
4. Kaul: Effective Business Communication; Prentice Hall, New Delhi. (English medium).
5. Patri VR: Essentials of Communication; Greenspan Publications, New Delhi. (English medium)
6. Senguin J: Business Communication; The Real World and Your Career, Allied Publishers, New Delhi. (English medium)
7. Dr. Mishra, Shukla & Patel; Business Communication; SBPD Publishing House, Agra. (Both Hindi and English medium)

B.Com Part- I

Compulsory

Group – II

Paper – I - Business Mathematics

Proposed Syllabus

OBJECTIVE – To enable the students to have such minimum knowledge of mathematics as is applicable to business and economic situations.

UNIT –I

Simultaneous Equations– Meaning, Characteristics, Methods of Solving Equations in Two Variables– Graphical, Substitution, Elimination and Cross Multiplication.

Linear Programming –Formulation of LLP : Graphical method of solution ; Problems relating to two variables including the case of mixed constraints .

UNIT –II

Matrices and Determinants : Definition of a matrix ; Type of a matrices ; Algebra of matrices ; Properties of determinants ; Calculation of values of determinants upto third order ; Logarithm's & Antilogarithm's.

UNIT –III

Simple interest and Compound Interest .

Annuties : Types of annuities ; Present value and amount of an annuity, including the case of continuous compounding ; Valuation of simple loans and debentures; Problems relating to sinking funds.

UNIT –IV

Ratio & Proportion.

Average, Percentage.

UNIT –V

Commission, Brokerage, Discount, Profit and loss.

Transpotation Problems.

Suggested Readings:

1. Dr. Amarnath Dikshit, Dr. Jinendra Kumar Jain; Business Mathematics ;Himalaya Publishing House, Mumbai. (Both Hindi and English medium)
2. N.K. Nag : Business Mathematics; Kalyani publication, New Delhi. .
3. Dr. V.K. Shukla. : Business Mathematics; Madhya Pradesh hindi Granth Academy: Bhopal.
4. S.M. Shukla; Business Mathematics; Sahitya Bhawan Publication ; Agra. (Both Hindi and English medium)
5. Dr. Karim & Agrawal ; Business Mathematics; SBPD Publishing House ; Agra. (Both Hindi and English medium)
6. Dr. Ramesh Mangal; Business Mathematics; Satish Printer and Publishers, Indore.

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अनिवार्य
समूह–2 प्रश्नपत्र – 1 – व्यावसायिक गणित

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 कलन : अवकलन : आंशिक अवकलज– द्वितीय क्रम तक, फलनो की समघातीयता एवं यूलर प्रमेय, उच्चिठ एवं निम्निष्ठ – एक चर के द्वितीय या उच्च क्रम से जुड़े सवाल । लघुगणक।	**इकाई – 1** युगपद् समीकरण – अर्थ, विशेषताऐं, दो चर वाले समीकरण को हल करने की विधियॉ – रेखीय विधि,प्रतिस्थापन विधि, विलोपन विधि, वज्रगुणन विधि। रेखीय प्रक्रमन : रेखीय प्रक्रमन समस्या को गणितीय रूप मे लिखना : ग्राफीक विधि से हल, द्विचर से संबंधित मिश्रित निबाध समस्याएं।
इकाई – 2 आव्यूह एवं सारणिक : आव्यूह की परिभाषा , आव्यूह के प्रकार, आव्यूह बीजगणित, सारणिक के गुण, तृतीयक्रम के सारणिकों के मान की गणना, आव्यूह का सहखण्डज , पंक्ति या स्तम्भ मूल क्रियाएं, मूल पंक्ति या स्तम्भ क्रियाओं द्वारा आव्यूह का व्युत्क्रम ज्ञात करना , अद्वितीय हल रखने वाली तथा तीन से अधिक चर न रखने वाली युगपत् समीकरणों का हल।	**इकाई – 2** आव्यूह एवं सारणिक : आव्यूह की परिभाषा , आव्यूह के प्रकार, आव्यूह बीजगणित, सारणिक के गुण, तृतीयक्रम के सारणिकों के मान की गणना। लघुगणक एवं प्रतिलघुगणक।
इकाई – 3 रेखीय प्रक्रमन : रेखीय प्रक्रमन समस्या को गणितीय रूप मे लिखना : ग्राफीक विधि से हल, समस्या का कोई सम्भव हल नही, अनेक हल, असीम समस्या का हल, व्यर्थ निबाध। परिवहन समस्या , अनुपात एवं समानुपात।	**इकाई – 3** साधारण ब्याज एवं चक्रवृद्धि ब्याज । वार्षिकी : वार्षिकी के प्रकार , वार्षिकी का वर्तमान मूल्य एवं मिश्रधन, ब्याज का सतत संयोजन, साधारण ऋण एवं ऋणपत्र का मूल्यांकन , शोधन निधि के प्रश्न।
इकाई – 4 चक्रवृद्धि ब्याज एवं वार्षिकी : विभिन्न प्रकार की ब्याज दरें, वर्तमान मूल्य एवं मिश्रधन की गणना, वार्षिकी के प्रकार , वार्षिकी का वर्तमान मूल्य एवं मिश्रधन, ब्याज का सतत संयोजन, साधारण ऋण एवं ऋणपत्र का मूल्यांकन , शोधन निधि के प्रश्न।	**इकाई – 4** अनुपात एवं समानुपात। औसत : साधारण, भारित एवं सांख्यकीय औसत (समान्तर माध्य)। प्रतिशतता।
इकाई – 5 औसत, प्रतिशतता, कमीशन एवं दलाली, लाभ एवं हानि	**इकाई – 5** कमीशन, दलाली, बट्टा, लाभ एवं हानि। परिवहन समस्या।

Suggested Readings:

1. Dr. Amarnath Dikshit, Dr. Jinendra Kumar Jain; Business Mathematics ;Himalaya Publishing House, Mumbai. (Both Hindi and English medium)
2. N.K. Nag : Business Mathematics; Kalyani publication, New Delhi. .
3. Dr. V.K. Shukla. : Business Mathematics; Madhya Pradesh hindi Granth Academy: Bhopal.
4. S.M. Shukla; Business Mathematics; Sahitya Bhawan Publication ; Agra. (Both Hindi and English medium)
5. Dr. Karim & Agrawal ; Business Mathematics; SBPD Publishing House ; Agra. (Both Hindi and English medium)
6. Dr. Ramesh Mangal; Business Mathematics; Satish Printer and Publishers, Indore.

B.Com Part- I

Compulsory

Group – II

Paper – II – BUSINESS REGULATORY FRAMEWORK

Proposed Syllabus

OBJECTIVE – To provide a brief idea about the framework of Indian business laws.

UNIT –I

Law of Contract (1872) –I : Nature of contract ; Classification ; Offer and acceptance; Capacity of parties to contract, free consent, Considerations, Legality of object; Agreement declared void.

UNIT –II

Law of Contract (1872) - II : Performance of contract, Discharge of contract; Remedies for breach of contract.

Special contracts; Indemnity ; Guarantee; Bailment and pledge; Agency.

UNIT –III

Sale of Goods Act (1930) ;Formation of contracts of sale ;Goods and their classification, price, Conditions and warranties; Transfer of property in goods; Performance of the contract of sales; Unpaid seller and his rights; sale by auction; Hire purchase agreement.

UNIT –IV

Negotiable Instrument Act (1881) : Definition of negotiable instrument; Feature; Promissory note; Bill of exchange & cheque; Holder and holder in the due course; Crossing of a cheque, types of crossing; Negotiation; Dishonor and discharge of negotiable instrument.

UNIT –V

The Consumer Protection Act 1986 : Main Provision, Definition of consumer ,Consumer Disputes , Grievance redressal machinery ; Indian Partnership Act 1932.

Limited Liabilities Partnership Act 2008.

Introduction of Intellectual Property Right Act – Copyright, Patent & Trademark.

Suggested Readings:

1. Kuchal M.C. ; Business Law ; Vikas Publishing House, Delhi. (English medium)
2. Kapoor N.D. : Business Law ; Sultan Chand & Sons, New Delhi. (English medium)
3. Chandha P.R. : Business Law; Galgotia ,New Delhi. (English medium)
4. Dr. J.K. Vaishnav : Business Law; Sahitya Bhawan publication, Agra. (English medium)
5. Prof. R. C. Agrawal; Business Regulatory Framework; SBPD Publishing House, Agra. (Hindi medium)
6. K.R. Bulchandani; Business Law; Himalaya Publishing House , Mumbai. (Both Hindi and English medium)
7. R.L. Navlakha; Business Law; Ramesh Book depot, Jaipur. (Both Hindi and English medium)
8. Arun Kumar Gangele; Business Regulatory Framework; Ram Prasad & Sons, Agra. (Hindi medium)

बी,कॉम. भाग – एक

अनिवार्य

समूह–2 प्रश्नपत्र – 2 – व्यावसायिक नियमन रूपरेखा

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 भारतीय अनुबंध अधिनियम (1872) : अनुबंध की प्रकृति : वर्गीकरण , प्रस्ताव तथा स्वीकृति, अनुबंध के योग्य पक्षकार , पक्षकारो की स्वतंत्र सहमति , प्रतिफल, उद्देश्य की वैधता , व्यर्थ घोषित ठहराव : अनुबंध का निष्पादन , अनुबंधो की समाप्ति , अनुबंध भंग के उपाय एवं परिणाम।	**इकाई – 1** भारतीय अनुबंध अधिनियम (1872) : अनुबंध की प्रकृति : वर्गीकरण , प्रस्ताव तथा स्वीकृति, अनुबंध के योग्य पक्षकार , पक्षकारो की स्वतंत्र सहमति , प्रतिफल, उद्देश्य की वैधता , व्यर्थ घोषित ठहराव ।
इकाई – 2 विशिष्ट अनुबंध : क्षतिपूर्ति , प्रतिभूति, निक्षेप, गिरवी अनुबंध, एजेंसी।	**इकाई – 2** अनुबंध का निष्पादन ;अनुबंधो की समाप्ति , अनुबंध भंग के उपाय एवं परिणाम। विशिष्ट अनुबंध : क्षतिपूर्ति , प्रतिभूति, निक्षेप , गिरवी अनुबंध, एजेंसी।
इकाई – 3 वस्तु विक्रय अधिनियम (1930) : वस्तु विक्रय अनुबंध का निर्माण , माल का वर्गीकरण , कीमत, शर्ते और आश्वासन , माल के स्वामित्व का हस्तांतरण, विक्रय अनुबंध का निष्पादन , अदत्त विक्रेता के अधिकार , नीलाम द्वारा विक्रय , किराया क्रय ठहराव।	**इकाई – 3** वस्तु विक्रय अधिनियम (1930) : वस्तु विक्रय अनुबंध का निर्माण , माल का वर्गीकरण , कीमत, शर्ते और आश्वासन , माल के स्वामित्व का हस्तांतरण, विक्रय अनुबंध का निष्पादन , अदत्त विक्रेता के अधिकार , नीलाम द्वारा विक्रय , किराया क्रय ठहराव।
इकाई – 4 विनिमय साध्य विलेख अधिनियम (1881) : परिभाषाएं, विशेषताएं , प्रतिज्ञा पत्र, विनिमय विपत्र और धनादेश (चैक) : धारक तथा यथाविधिधारी , रेखांकित चैक, रेखांकन के प्रकार, परक्रामण, विनिमय साध्य विलेख का अनदारण व मुक्ति।	**इकाई – 4** विनिमय साध्य विलेख अधिनियम (1881) : परिभाषाएं, विशेषताएं , प्रतिज्ञा पत्र, विनिमय विपत्र और धनादेश (चैक) : धारक तथा यथाविधिधारी , रेखांकित चैक, रेखांकन के प्रकार, परक्रामण, विनिमय साध्य विलेख का अनदारण व मुक्ति।
इकाई – 5 उपभेक्ता संरक्षण अधिनियम (1986) : मुख्य विशेषताएं , उपभोक्ता की परिभाषा , उपभोक्ता विवाद निवारण अभिकरण। मुख्य प्रावधान , सूचना का अधिकार अधिनियम (2005) – मुख्य प्रावधान।	**इकाई – 5** उपभेक्ता संरक्षण अधिनियम (1986) : मुख्य विशेषताएं , उपभोक्ता की परिभाषा , उपभोक्ता विवाद निवारण अभिकरण। भारतीय साझेदारी अधिनियम 1932। सीमित दायित्व वाली साझेदारी अधिनियम 2008। बौद्धिक संपदा अधिकार अधिनियम का परिचय – कॉपीराईट, पेटेन्ट एवं ट्रेडमार्क।

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Suggested Readings:

1. Kuchal M.C. ; Business Law ; Vikas Publishing House, Delhi. (English medium)
2. Kapoor N.D. : Business Law ; Sultan Chand & Sons, New Delhi. (English medium)
3. Chandha P.R. : Business Law; Galgotia ,New Delhi. (English medium)
4. Dr. J.K. Vaishnav : Business Law; Sahitya Bhawan publication, Agra. (English medium)
5. Prof. R. C. Agrawal; Business Regulatory Framework; SBPD Publishing House, Agra. (Hindi medium)
6. K.R. Bulchandani; Business Law; Himalaya Publishing House , Mumbai. (Both Hindi and English medium)
7. R.L. Navlakha; Business Law; Ramesh Book depot, Jaipur. (Both Hindi and English medium)
8. Arun Kumar Gangele; Business Regulatory Framework; Ram Prasad & Sons, Agra. (Hindi medium)

B.Com Part- I

Compulsory

Group – III

Paper – I – BUSINESS ENVIRONMENT

Proposed Syllabus

OBJECTIVE – To acquainting the students with the emerging issues in business at the national and international level in the light of the policies of liberalization and globalization.

UNIT –I

Business Environment : Concept, Components and Importance ,Economic Trends (overview) : Income : Saving and investment ; Trade and balance of payment, Money and Finance .

UNIT –II

Problems of Growth : Unemployment ; Poverty ; Regional imbalances ; Social Injustice; Inflation ; Parallel economy ; Industrial sickness.

UNIT –III

Role of Government ; Monetary and fiscal policy ; Industrial policy ; Industrial licensing. Privatization ; Liberalisation, Globalisation Devaluation; Demonitisation; Export-Import policy.

UNIT –IV

Economic Planning in India : Need, objectives, Strategy; Review of Previous Plans, Planning Commission.

Foreign Exchange Management Act 2000 : Basic Concept and Main Provisions.

UNIT –V

International Environment ; Trends in World trade and the problems of developing countries; Foreign trade and economic growth; International economic groupings – GATT. ,WTO ,UNCTAD, World Bank, IMF; FDI.

Suggested Readings:

1. Agarwal A. N. : Indian Economy, Vikas Publishing House Delhi. (English medium)
2. Khan Faroog A : Business and Society; S. Chand , Delhi. (English medium)
3. Dutt R. and Sundharam K. Pm. ; Indian Economy; S. Chand , Delhi. (English medium)
4. Misra S.K. and Puri V.K. : Indian Economy; Himalaya Publishing House, New Delhi. (English medium)
5. Dr. V.C. Sinha; Business Environment; SBPD Publishing House, Agra . (Both Hindi and English medium)
6. Dr. J. K. Jain; Business Environment; Madhya Pradesh hindi Granth Academy: Bhopal. (Hindi medium)
7. Gupta & Pathak; Business Environment; Ram Prasad & Sons, Raipur. (Hindi medium)
8. S.K. Singh; Business Environment; SBPD Publishing House, Agra . (Both Hindi and English medium)

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अनिवार्य
समूह–3 प्रश्नपत्र – 1 – व्यावसायिक पर्यावरण

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 भारतीय व्यावसायिक पर्यावरण : अवधारणा, संघटक व महत्व। आर्थिक प्रवृत्तियॉ : आय, बचत एवं विनियोग, औद्योगिक प्रवृत्तियॉ; व्यापार एवं भुगतान सन्तुलन, मुद्रा , वित्त तथा कीमत।	**इकाई – 1** व्यावसायिक पर्यावरण : अवधारणा, संघटक व महत्व, आर्थिक प्रवृत्तियॉ : आय, बचत एवं विनियोग; व्यापार एवं भुगतान सन्तुलन, मुद्रा एवं वित्त ।
इकाई – 2 विकास की समस्याऍ : बेरोजगारी ,निर्धनता एवं क्षेत्रीय असन्तुलन, सामाजिक अन्याय, मुद्रास्फीति, समान्तर अर्थव्यवस्था , औद्योगिक रूग्णता।	**इकाई – 2** विकास की समस्याऍ : बेरोजगारी ,निर्धनता एवं क्षेत्रीय असन्तुलन, सामाजिक अन्याय, मुद्रास्फीति, समान्तर अर्थव्यवस्था , औद्योगिक रूग्णता।
इकाई – 3 शासन की भूमिका : मौद्रिक एवं राजकोषीय नीति, औद्योगिक नीति, औद्योगिक लाइसेंसिंग नीति ,निजीकरण , अवमूल्यन, निर्यात–आयात नीति, विदेशी विनियोग का नियमन ।	**इकाई – 3** शासन की भूमिका (वर्तमान परिदृश्य में) : मौद्रिक एवं राजकोषीय नीति, औद्योगिक नीति, औद्योगिक लाइसेंसिंग नीति ,निजीकरण , उदारीकरण, भूमण्डलीकरण, अवमूल्यन, विमुद्रिकरण निर्यात–आयात नीति, विदेशी विनियोग का नियमन ।
इकाई – 4 पुर्व योजनाओं की समीक्षा , चालू पंचवर्षीय योजना : मुख्य रणनीति, संसाधनों आबंटन।	**इकाई – 4** भारत में आर्थिक नियोजन : आवश्यकता , उद्देश्य एवं व्यूहरचना, पुर्व पंचवर्षीय योजनाओं की समीक्षा , चालू पंचवर्षीय योजना । विदेशी विनिमय प्रबंध अधिनियम 2000 : अवधारणा एवं मुख्य प्रवधान।
इकाई – 5 अंतराष्ट्रीय पर्यावरण : अंतराष्ट्रीय व्यापारिक पर्यावरण , विश्व व्यापार की प्रवृत्ति एवं विकासशील देशों की समस्याऍ, विदेशी व्यापार एवं आर्थिक विकास , अंतराष्ट्रीय आर्थिक समूह– अंतराष्ट्रीय अर्थव्यवस्था की संस्थाये, विश्व व्यापार संगठन , व्यापार एवं प्रशुल्क एवं व्यापार संबंधि सामान्य समझौता (गैट) , विश्व बैंक , अंतराष्ट्रीय मुद्रा कोष , अंतराष्ट्रीय पुनर्निमाण एवं विकास बैंक, प्रति व्यापार , एफ. डी. आई.।	**इकाई – 5** अंतराष्ट्रीय पर्यावरण : विश्व व्यापार की प्रवृत्ति एवं विकासशील देशों की समस्याऍ, विदेशी व्यापार एवं आर्थिक विकास , अंतराष्ट्रीय आर्थिक समूह– प्रशुल्क एवं व्यापार संबंधि सामान्य समझौता (गैट) , विश्व व्यापार संगठन, विश्व बैंक , अंतराष्ट्रीय मुद्रा कोष ,प्रत्यक्ष विदेशी निवेश, संयुक्त राष्ट्र व्यापार एवं विकास संगठन (अंकटाड़)।

Suggested Readings:

1. Agarwal A. N. : Indian Economy, Vikas Publishing House Delhi. (English medium)
2. Khan Faroog A : Business and Society; S. Chand , Delhi. (English medium)
3. Dutt R. and Sundharam K. Pm. ; Indian Economy; S. Chand , Delhi. (English medium)
4. Misra S.K. and Puri V.K. : Indian Economy; Himalaya Publishing House, New Delhi. (English medium)
5. Dr. V.C. Sinha; Business Environment; SBPD Publishing House, Agra . (Both Hindi and English medium)
6. Dr. J. K. Jain; Business Environment; Madhya Pradesh hindi Granth Academy: Bhopal. (Hindi medium)
7. Gupta & Pathak; Business Environment; Ram Prasad & Sons, Raipur. (Hindi medium)
8. S.K. Singh; Business Environment; SBPD Publishing House, Agra . (Both Hindi and English medium)

B.Com Part- I

Compulsory

Group – III – Business Economics

Paper – II– BUSINESS ECONOMICS

Proposed Syllabus

OBJECTIVE – To acquaint the students with the principles of Business Economics as are applicable in business.

UNIT –I

Introduction : Definition ,Nature and Scope of Economics, Difference Between Micro and Macro Economics, Method of Economic Study : Inductive and Deductive Methods.

Basic problem of Economy, Working of Price Mechanism.

Utility Analysis: Measurements of Utility, Law of Diminishing Marginal Utility, Law of Equi-Marginal Utility.

UNIT-II

Law of demand: Meaning and Definitions, Effecting Factors, Types ; Exception of Law of demand.

Elasticity of Demand : Concept, Definitions, Importance, Types and Measurement of Elasticity of Demand, Factors affecting the Elasticity of Demand.

UNIT –III

Production : Factors of Production ,their characteristics and importance.

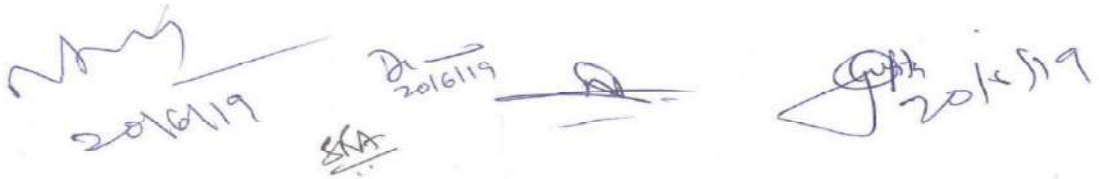
Production Functions : Law of Variable Proportions, Return to scale and Equal Product Curve Analysis. Internal and external economies and diseconomies.

UNIT –IV

Market Structure – Concept , Characteristics, Classification. Determination of Price under condition of Perfect Competition, Imperfect Competition and Monopoly, Monopolistic Competition, Oligopoly and Duopoly.

UNIT –V

Theories of distribution, Marginal Productivity theory of distribution, Concept and theories of Wages, Rent, Interest & Profit.



Suggested Readings:

1. John P. Gould, Jr. and Edward P. Lazear: Micro economic theory; All India Traveller, Delhi. (English medium)
2. Koutsoyianni A. : Modern Microeconomics: Macmillan, New Delhi. (English medium)
3. Khan Faroog A : Business and Society; S. Chand , Delhi. (English medium)
4. Misra S.K. and Puri V.K. : Indian Economy; Himalaya Publishing House, New Delhi. (English medium)
5. M. L. Jhingan : Micro Economics, Vrinda publication, Delhi. (Both English and Hindi medium)
6. Dr. J. K. Jain; Business Economics; Madhya Pradesh hindi Granth Academy: Bhopal. (Hindi medium)
7. Dr. V.C. Sinha; Business Economics; SBPD Publishing House, Agra. (Both English and Hindi medium)
8. Dr. Jai Prakash Misra; Business Economics; Sahitya Bhawan Publication, Agra. (Hindi medium)

बी,कॉम. भाग – एक
अनिवार्य
समूह–3 प्रश्नपत्र – 2 – व्यावसायिक अर्थशास्त्र

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
इकाई – 1 परिचय : अर्थशास्त्र की मुख्य समस्याएं , कीमत संयंत्र के कार्य, मांग की लोच , मांग की लोच मापने की विधियां एवं अवधारणाएं : कीमत , आय तथा आडी लोच, औसत आगम, सीमान्त आगम एवं मांग की लोच , मांग की लोच का निर्धारण तथा मांग की लोच का महत्व।	**इकाई – 1** परिचयः अर्थशास्त्र की परिभाषा, प्रकृति एवं क्षेत्र, व्यष्टि एवं समष्टि अर्थशास्त्र में भेद, आर्थिक अध्ययन की प्रणालियां : निगमन एवं आगमन । अर्थव्यवस्था की मूल समस्याएं, कीमत संयंत्र का कार्यकरण। उपयोगिता विश्लेषण – उपयोगिता की माप, सीमांत उपयोगिता ह्रास नियम , समसीमांत उपयोगिता नियम ।
इकाई – 2 उत्पादन फलन, परिवर्तन अनुपात का नियम , समोत्पाद , विस्तार पथ, पैमाने के प्रतिफल , आंतरिक एवं बाह्य मितव्ययिता एवं अपमितव्ययिता।	**इकाई – 2** मांग का नियम : अर्थ, परिभाषा , प्रभावित करने वाले धटक, मांग के रूप, मांग के नियम के अपवाद। मांग की लोच : अवधारणा, परिभाषा, महत्व, प्रकार एवं मापन की विधियां, मांग की लोच को प्रभावित करने वाले धटक।
इकाई – 3 लागत अवधारणाएं , अल्पकालीन एवं दीर्घकालीन लागत वक्र, परम्परागत एवं आधुनिक विचारधारा। बाजार संरचना तथा व्यावसायिक निर्णयन, व्यावसायिक फर्म के उद्देश्य। (अ) पूर्ण प्रतियोगिता , लाभ अधिकतमीकरण तथा फर्म का साम्य , औद्योगिक अल्पकालीन एवं दीर्घकालीन पूर्ति वक्र, कीमत एवं उत्पाद निर्धारण। (ब) एकाधिकार : एकाधिकार मे मूल्य निर्धारण , फर्म का साम्य , पूर्ण प्रतियोगिता एवं एकाधिकार में अन्तर ,एकाधिकार के अंर्तगत कीमत विभेद।	**इकाई – 3** उत्पादन : उत्पादन के कारक ,उनकी विशषताएं एवं महत्व। उत्पादन फलन : परिवर्तनशील अनुपातों का नियम , पैमाने का प्रतिफल ,समोत्पाद वक्र विश्लेषण। आंतरिक एवं बाह्य मितव्ययिता एवं अपमितव्ययिता।
इकाई – 4 बाजार संरचनाः (अ)एकाधिकृत प्रतियोगिता : आशय एवं विशेषतांए , कीमत एंव उत्पाद निर्धारण , उत्पाद विभेद , विक्रय लागत, पूर्ण प्रतिस्पर्धा से तुलना , अतिरिक्त क्षमता सिद्धांत। (ब) अल्पाधिकार : विशषताएं , कीमत एवं उत्पाद निर्धारण , परंपरागत मॉडल, कीमत नेतृत्व , कपटपूर्ण अल्पाधिकार।	**इकाई – 4** बाजार संरचनाः अवधारणा, परिभाषाएं, विशेषताएं एवं वर्गीकरण। पूर्ण प्रतियोगिता, अपूर्ण प्रतियोगिता, एकाधिकारी प्रतियोगिता, एकाधिकृत प्रतियोगिता ,अल्पाधिकार एवं द्वयाधिकार में कीमत निर्धारण।
इकाई – 5 कीमत कारक– I सीमान्त उत्पादकता सिद्धांत तथा मांग कारक, पूर्ति की प्रकृति, पूर्ण प्रतियोगिता एवं एकाधिकार में मजदूरी दर का निर्धारण ,श्रम का शोषण। कीमत कारक – II – लगान अवधारणा , रिकार्डो का	**इकाई – 5** वितरण का सिद्धांत : सीमान्त उत्पादकता का सिद्धांत , मजदूरी, लगान, ब्याज एवं लाभ की अवधारणा एवं सिद्धांत ।

वर्तमान पाठ्यक्रम	प्रस्तावित पाठ्यक्रम
लगान सिद्धांत तथा लगान का आधुनिक सिद्धांत , ब्याज अवधारणा तथा ब्याज का सिद्धांत लाभ की प्रकृति , अवधारणा तथा लाभ के सिद्धांत।	

Suggested Readings:

1. John P. Gould, Jr. and Edward P. Lazear: Micro economic theory; All India Traveller, Delhi. (English medium)
2. Koutsoyianni A. : Modern Microeconomics: Macmillan, New Delhi. (English medium)
3. Khan Faroog A : Business and Society; S. Chand , Delhi. (English medium)
4. Misra S.K. and Puri V.K. : Indian Economy; Himalaya Publishing House, New Delhi. (English medium)
5. M. L. Jhingan : Micro Economics, Vrinda publication, Delhi. (Both English and Hindi medium)
6. Dr. J. K. Jain; Business Economics; Madhya Pradesh hindi Granth Academy: Bhopal. (Hindi medium)
7. Dr. V.C. Sinha; Business Economics; SBPD Publishing House, Agra. (Both English and Hindi medium)
8. Dr. Jai Prakash Misra; Business Economics; Sahitya Bhawan Publication, Agra. (Hindi medium)

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B. COM - I (COMPUTER APPLICATION)
PAPER - I
COMPUTER FUNDAMENTALS

MAX MARKS : 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I INTRODUCTION TO COMPUTERS

Computer System: Characteristics and capabilities. Computer Hardware and Software: Block Diagram of Computer, Different Data Processing: Data, Data Processing System, Storing Data, Processing Data. Types of Computers: Analog, Digital, Hybrid General and Special Purpose Computers. Generation of Computers. Computer Systems: Micro, Minis & Main-Frames. Limitations of Micro Computer. **Number systems:** Decimal number system. Binary number system. Octal and Hexadecimal number system. 1's and 2's complement. **Codes:** ASCII, EBCDI codes, Gray code and BCD. **Logic Gates**: AND, OR, NOT GATES and their Truth tables, NOR NAND and XOR gates.

UNIT-II COMPUTER PERIPHERALS

Introduction to Input Devices: Categorizing Input Hardware, Keyboard, Direct Entry- Card Readers Scanning Devices - O.M.R. Character Readers, Thumb Scanner, MICR Smart Cards, Voice Input Devices Pointing Devices - Mouse Light Pen, Touch Screen. **Computer Output :** Output Fundamentals, Hardcopy Output Devices, Impact Printers, Non-Impact Printers, Plotters, Computer output Microfilm/Microfiche (COM) System, Softcopy Output Devices, Cathode Ray Tube, Flat Screen Technologies, Projectors, Speakers.

UNIT-III BASIC COMPONENTS AND STORAGE

Central Processing Unit : The Microprocessor, control unit, A.L.U., Registers, Buses, Main Memory, Main Memory(RAM) for microcomputers, Read Only Memory(ROM). Storage Devices: Storage Fundamentals, Primary and Secondary Storage, Data Storage and Retrieval Methods – Sequential, Direct & Indexed Sequential, Tape Storage and Retrieval Methods Tape storage Devices, characteristics and limitations, Direct access Storage and Microcomputers - Hard Disks, Disk Cartridges, Direct Access Storage Devices for large Computer systems, Mass storage systems and Optical Disks, CD ROM.

UNIT-IV COMPUTER SOFTWARE AND LANGUAGES

System Software: System software Vs. Application Software, Types of System Software, Introduction and Types of Operating Systems, Boot Loader, Diagnostic programs, BIOS, Utility Programs, **Application Software** : Microcomputer Software, Interacting with the System, Trends in PC software, Types of Application Software, Difference between Program and Packages. **Computer Language:** Definition, Generations of Computer languages, Types of Languages, **Language Processors:** Assembler, Interpreter, Compiler, Linker and Loader, Programming constructs, Algorithm and flowchart.

UNIT-V INTRODUCTION TO MS-DOS AND WINDOWS

Introduction to DOS: History and Versions of DOS Fundamentals of DOS: Physical Structure of the Disk, Compatibility of drives, Disks & DOS versions, Preparing Disks for use, Device Names. Getting Started with DOS: Booting Process (DOS, Windows ,UNIX), System Files and Command.com, Internal DOS files & Directories, Elementary External DOS Commands, Creating a Batch Files, Additional Commands. **Microsoft Windows: Operating** system, Definition and functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel-display properties, adding and removing software and hardware setting sate and time, screen saver and appearance. Using windows accessories.

TEXT BOOK

1. Introduction to Information Technology, V. Rajaraman, PHI Sixth Edition.
2. Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
3. Fundamentalsof Information Technology, Chetan Shrivastava, Kalyan Publishers.
4. Computers Today, Suresh K. Basandra, Galgotia Publications.

B. COM - I (COMPUTER APPLICATION)

PAPER - II

PC S/W & MM

MAX MARKS: 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I USING OFFICE MS-WORD

Introduction to word processing software and if's features, Creating new document, Saving documents, Opening and printing documents. **Home Tab: Setting** fonts, Paragraph settings, various styles (Normal, No spacing, Heading1, Heading2, Title Strong), Find & replace, Format Printer, Copy paste and pasts special. **Insert Tab: Pages**, Tables, pictures, clipart, shapes, header & footer, word art, equation and symbols. **Page Layout Tab: Page** setup, page Background, Paragraph (indent and spacing). **Mailing Tab:** Create envelops and Labels, Mail merge. **Review Tab: Spelling** and grammar check, new comment, Protect document**. View Tab: Document** views, zoom, Window (New window, Split, Switch window).

UNIT-II WORKING WITH MS-EXCEL

Introducing Excel, Use of Excel sheet, Creating new sheet, Saving, Opening & Printing workbook. **Home Tab: Font**, Alignment, Number, Styles and cells and editing, Conditional Formatting. **Insert Tab: Table**, Charts (Column Chart, Pie chart, Bar chart, Line chart) and Texts (heading & Footer, word art, signature line). **Page Layout Tab:** Page setup options, Scale to fit (width, height, scale) **Formulas Tab :** Autosum (sum, average, min, max). Logical (IF, and, or, not, true, false), Math & trig (sin, cos, tan, ceiling, floor, fact, mod, log), watch window. **Data Tab: Get** external data from MS Access, Sort and filter options, Data validation, Group and ungroup. **Review Tab: Protect** sheet, Protect workbook and Share workbook. **View Tab: Page** break, Page layout, Freezing panes, Split and hide.

UNIT-III WORKING WITH MS-POWERPOINT

Introducing power point, Use of power point presentation, Creating new slides saving, Opening and printing. **Home Tab: New** slide, Layout, Reset, Delete, Setting text direction, Align text, Convert to smart art, drawing options. **Insert Tab: Table** picture, clipart, photo album, smart art, shapes and chart, movie and sound, hyperlink and action, text box, word art, object **Design Tab:** Page setup option, slide orientation, applying various themes, selecting background style and formatting it. **Animation Tab: Custom** animation for entrance, exit and emphasis, applying slide transition, setting transition speed and sound, animation on rehears timing. **Slide show & View Tab: Start** slide show options, setup option. **View Tab: Presentation** views, colours and window option.

UNIT-IV WORKING WITH MS-ACCESS

Front end and back end of application, Introduction to DMBS, features of dbms, Creating blank databases, Saving it in accdb format. Defining data type in MS Access. **Home Tab: Datasheet** view, design view, pivot chart view, pivot table view, sort and filter prions. **Create Tab: Creating** tables, creating reports, query wizard. **External Data Tab: Importing** data from access and excel sheet, exporting data to excel and MS word. **Datasheet Tab:** Relationships, fields and columns options, Data type and formatting options.

UNIT-V ANIMATION AND GRAPHICS

Basic concept of 2D/3D Animation, Principle of animation, application of Multimedia, hardware and Software resources requirement for animation, introduction of various file formats (.mpeg, .gif, .jpeg,. mp4, .tif, .flv) **Creating a new movie in flash :**Get set Up, Input Text, Animate Text, Drawing and painting with tools, brush, create basic shapes like oval, Rectangle & Polystar Tools, Tools working with object & filing the object. Transformation object properties dialog box, creating layers motion tweeing, shape tweeing, Mask layers, basic action scripts, importing sound trough Flash.

TEXT BOOK

1. Microsoft Office 2007 Fundamentals, L. Story, D. Walls.
2. MS Office, S.S. Shrivastava, Firewall Media.
3. Office 2000 made easy, Alan Neibauer, Tata McGraw Hill.
4. FLASHMX Bible, Robert Reinhart.
5. Sams Teach Yourself Macromedia Flash 8 in 24 Hours, Phillip Kerman
6. How to do everything with Macromedia, Bonnic Blake, Doug Sahlin
7. Multimedia Making it works, Tay Vaughan Tata McGraw Hill.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 1458 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

——00——

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर के निम्नलिखित कक्षा/विषय के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से स्नातक के तीनों वर्ष के लिए लागू किया जाता है।

1. बी.कॉम. – आधार पाठ्यक्रम–हिन्दी भाषा एवं वाणिज्य।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार

कुलसचिव

क्र. 1459 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 के परिपेक्ष्य में सूचनार्थ।
2. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

B. Com. - II

INDEX

1. Revised Ordinance No.-23
2. Scheme of Examination
3. Hindi Language
4. English Language
5. G-I
   1. Corporate Accounting
   2. Company Law
6. G-II
   1. Cost Accounting
   2. Principle of Business Management
7. G-III
   1. Business Statistics
   2. Fundamental of Entrepreneurship
8. Computer Application

REVISED ORDINANCE NO.-23

(As per State U.G.C. Scheme)

BACHELOR OF COMMERCE

1. The three year course has been broken up into three Parts.

   Part-I known as B. Com. Part-I Examination at the end of first year. Part-II Examination at the end of the second year, and,
   Part-III Examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of Chhattisgarh Board of Secondary Education, Raipur or any other examination recognized by the University or Chhattisgarh Board of Secondary Education as equivalent there to has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year, shall be eligible for appearing at the B.Com. Part-I examination.

3. A candidate who after passing B.Com. Part-I examination of the University or any other examination recognized by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-II Examination.

4. A candidate who after passing B.Com. Part-II examination of the University has completed a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate students shall be eligible for admission to the examination as per provision of Ordinance No. 6 relating to examinations (General).

6. Provided that non-collegiate candidates shall be permitted to offer only such subject/ papers as are taught to the regular students at any of the University Teaching Department or College.

7. Every candidate for B.Com. Examination shall be examined in subjects as mentioned in the marking scheme and course or studies.

8. A candidate who has passed the B.Com. Part-III examination of the University shall be

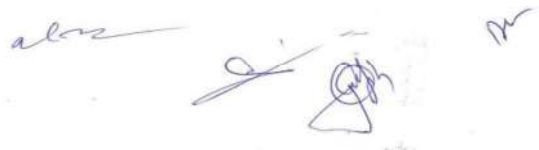
allowed to present him of examination in any of the additional subjects prescribed for the B.Com. Examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B. Com. Part-I examination in the subject which he proposes to offer then the B.Com. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

9. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total marks in each paper/group of subjects. In group where both theory and practical examinations are provided an examinee must pass in both theory and practical parts of examination separately.

10. Candidate will have to pass separately at the Part-I, Part-II and Part-III examination. No division shall be assigned on the result of the Part-I and Part-II examinations In determining the division of the Final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part-I examination.

11. Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject/group only, the total aggregate mark being carried over for determining the division, shall include actual marks obtained in the subject/group in which he appeared at the supplementary examination.

12. Successful examinees at the Part - III examination obtaining 60% or more marks shall be placed in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.



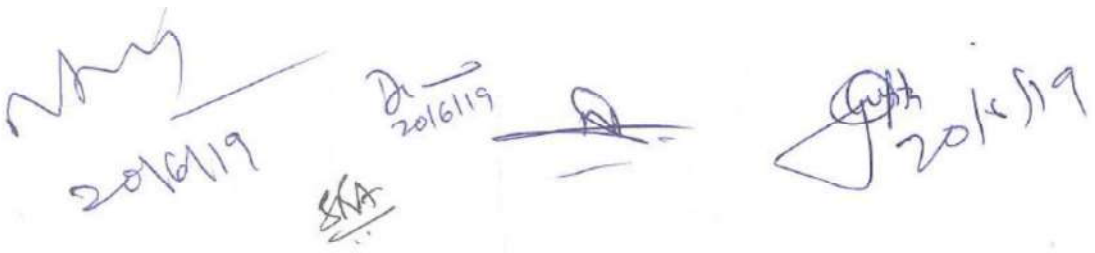
Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

SYLLABUS

B.COM. PART-II

GROUPING OF SUBJECTS AND SCHEME OF EXAMINATION

Subject		Max.	Min.
A. Foundation Course			
I. Hindi Language		**75**	**26**
II. English Language		**75**	**26**
B. Three Compulsory Groups			
Group-I			
I. Corporate Accounting	**75**	**150**	**50**
II. Company Law	**75**		
Group-II			
I. Cost Accounting	**75**	**150**	**50**
II. Principles of Bus. Management	**75**		
Group-III			
I. Business Statistics	**75**	**150**	**50**
II. Fundamental of Entrepreneurship	**75**		



संशोधित पाठ्यक्रम
बी.ए./बी.एस–सी./बी.कॉम./बी.एच.एस.–सी.
भाग – दो, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा) (पेपर कोड – 0171) **पूर्णांक– 75**

खण्ड – क निम्नलिखित 5 लेखकों के पाठ शामिल होंगे – **अंक–35**

1. महात्मा गांधी	–	चोरी और प्रायश्चित
2. आचार्य नरेंद्र देव	–	युवकों का समाज में स्थान
3. वासुदेव शरण अग्रवाल	–	मातृभूमि
4. हरि ठाकुर	–	डॉ. खूबचंद बघेल
5. पं. माधवराव सप्रे	–	सम्भाषण–कुशलता

खण्ड–ख हिन्दी भाषा और उसके विविध रूप **अंक–16**

1. कार्यालयीन भाषा
2. मीडिया की भाषा
3. वित्त एवं वाणिज्य की भाषा
4. मशीनी भाषा

खण्ड–ग हिन्दी की व्याकरणिक कोटियॉ **अंक–24**

संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण,
समास, संधि एवं संक्षिप्तियां
अनुवाद व्यवहार : अंग्रेजी से हिन्दी में अनुवाद

इकाई विभाजन–

इकाई– 1 चोरी और प्रायश्चित : महात्मा गांधी / कार्यालयीन भाषा, मीडिया की भाषा

इकाई– 2 युवकों का समाज में स्थान : आचार्य नरेन्द्र देव / वित एवं वाणिज्य की भाषा, मशीनी भाषा

इकाई– 3 मातृभूमिः वासुदेवशरण अग्रवाल / संज्ञा सर्वनाम, विशेषण, क्रिया विशेषण

इकाई– 4 डॉ. खूबचंद बघेल : हरि ठाकुर/समास, संधि,

इकाई– 5 सम्भाषण–कुशलता : पं. माधवराव सप्रे, / अनुवाद – अंग्रेजी से हिन्दी में अनुवाद, संक्षिप्तियॉ

मूल्यांकन योजना –

प्रत्येक इकाई से एक–एक प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई को दो–दो खण्डों (क्रमश' 'क' और 'ख' में) विभक्त करते हुए निर्धारित पाठ से 8 एवं शेष पाठ्य सामग्री से 7 अंक के प्रश्न होंगे। इस प्रकार पूरे प्रश्न–पत्र के पूर्णांक 75 होंगे।

पाठ्यक्रम संशोधन का औचित्य : विद्यार्थी चर्चित एवं सुप्रसिद्ध व्यक्तियों के लेख के माध्यम से समाज एवं राष्ट्रहित के साथ–साथ व्यक्तित्व विकास विषयक मुद्दों से परिचित हो सके तथा व्याकरिणक एवं भाषा विषयक प्रस्तावित पाठ्यक्रम के माध्यम से हिन्दी भाषा संबंधित प्रयोग पक्ष से परिचित होते हुए प्रतियोगी परीक्षाओं की दृष्टि से ज्ञानार्जन कर सके।

ENGLISH LANGUAGE (Paper Code-1132)

B.A. / B.Sc. /B.COM. /B.H. Sc. - II

M.M.75

The question paper for B.A. /B.Sc./B.Com./B.H.Sc., English Language and cultural valuers shall comprise the following units:

UNIT-I Short answer questions to be passed by (Five short answer questions of three marks each) 15 Marks

UNIT-II (a) Reading comprehension of an unseen passage 05 Marks

(b) Vocabulary

UNIT-III Report-Writing 10 Marks

UNIT-IV Expansion of an idea 10 Marks

UNIT-V Grammar and Vocabulary based on the prescribed text book. 20+15Marks

Note: Question on all the units shall asked from the prescribed text which will Comprise Specimens of popular creative/writing and the following it any

a Matter & technology

i. State of matter and its structure

ii. Technology (Electronics Communication, Space Science)

b Our Scientists & Institutions

I. Life & work of our eminent scientist Arya Bhatt. Kaurd Charak Shusruta, Nagarjuna, J.C. Bose and C.V. Raman, S. Rmanujam, Homi J. Babha Birbal Sahani.

II. Indian Scientific Institutions (Ancient & Modern)

Books Prescribed:

Foundation English for U.G. Second Year - Published by M.P. Hindi Granth Academy, Bhopal.

B.Com. II year

C O M P U L S O R Y

Group - I PAPER – I (CORPORATE ACCOUNTING)

(As per company act 2013)

Proposed Syllabus

OBJECTIVE

This course enable the students to develop awareness about corporate accounting in conformity with the provisions of companies Act.

UNIT-I Issue, Forfeiture, and Re-issue of Shares : Redemption of preference shares; Issue and redemption of debentures.

UNIT-II Final Accounts (as per company act 2013)
Liquidation of Company.

UNIT-III Valuation of Goodwill and Shares.

UNIT-IV Accounting for Amalgamation of Companies as per Indian Accounting Standard 14; Accounting for internal reconstruction - excluding intercompany holdings and re-construction schemes.

UNIT-V Consolidated Balance Sheet of holding companies with one subsidiary only.

SUGGESTED READINGS :

1. Dr. S.M. Shukla, Sahitya Bhawan Agra.
2. Dr. Mangal Mehta & Agrawal Published - Indore.
3. Dr. Karim Khanuja - Published - Agra.
4. Gupta R.L., Radhaswamy M; Company Accounts; Sultan Chand & Sons, New Delhi.

Group - I - PAPER – II

COMPANY LAW

Proposed Syllabus

OBJECTIVE

This objective of this course is to provide basic knowledge of the provisions Companies
Act. 2013, along with relevant case law.

UNIT-I Corporate personalities; Kinds of Companies, Nature & Scope, promotion on and incorporation of companies.

UNIT-II Memorandum of Association; Articles of Association; Prospectus, Shares; share capital - transfer and transmission.

UNIT-III Capital management - borrowing powers, mortgages and charges, debentures.
Directors - Managing Director, whole time director, Appointment, Remuneration, and duties.

UNIT-IV Company meetings - kinds, Notice, quorum, voting, proxy, resolutions, minutes.

UNIT-V Majority powers and minority rights; Prevention of oppression and mismanagement. Winding up - kinds and conduct.

SUGGESTED READINGS :

1. Singh Avtar : Company Law; Eastern Book Co., Lucknow.
2. Dr. S.M. Shukla, Shahitya Bhawan Agra.
3. Dr. R.C. Agrawal, Shahitya Bhawan Agra.
4. Kapoor N.D. : Company Law - Incorporating the Provisions of the comanies Amendment Act, 2013 Chand & Sons, New Delhi

Group - II PAPER – I

(COST ACCOUNT)

Proposed Syllabus

OBJECTIVE

This course exposes the students to the basic concepts and the tools used in cost accounting.

UNIT-I Introduction : Nature and scope of cost accounting ; Cost concepts and classfication; Methods and techniques; Installation of costing system; Concept of cost audit. Accounting for Material : Material Control; Concept and techniques; Pricing of material issues; Treatment of material losses.

UNIT-II Accounting for Labour : Labour cost control procedure; Labour turnover; Idle time and overtime; Methods of wage payment - time and piece rates; Incentive schemes. Accounting for overheads; Classification and departmentalization; Absorption of overheads; Determination of overhead rates; Under and over absorption, and its treatment.

UNIT-III Cost Ascertainment : Unit costing; Job, batch and contract costing.

UNIT-IV Operating costing; Process Costing - excluding inter - process profits, and joint and by - products.

UNIT-V Cost Records : Intergal and non - integral system; Reconciliation of cost and financial accounts; Break Even Point.

SUGGESTED READINGS :

1. M.L. Agrawal : Sahitya Bhawan Agra.
2. Maheshwari S.N. : Advanced Problems and Solutions in Cost Accounting; Sultan Chand, New Delhi.
3. Arora M.N. : Cost Accounting - Principles and Practice; Vikas, New Delhi.
4. Jain S.P. and Narang K.L. : Cost Accounting; Kalyani New Delhi.

Group - II - PAPER - II

PRINCIPLES OF BUSINESS MANAGEMENT

Proposed Syllabus

OBJECTIVE

This Course familiarizes the students with the basics basics of principles of management.

UNIT-I Introduction : Concept, nature, process, and significance of management; manage-ment roles (Mintzberg); An overview of functional areas of management; Development management thought; Classical and neo-classical systems; Concept approaches.

UNIT-II Planning : Concept, process and types.
Decision making - concept and Bounded rationality; Management by objectives; Corporate planning; Environment analysis and diagnosis; Strategy formulation.

UNIT-III Organizing : Concept, nature, process and significance; Authority and resident relationships; Centralization and decentralization; Departmentation; Organization structure - forms and contingency factors.

UNIT-IV Motivating and Leading People at work : Motivation - concept; Theories Herzberg, McGregor, and Ouchi; Financial and non- financial incentives.
Leadership - concept and leadrship styles; Leadership theories (Tannenb Schmidt.); Likert's System Management;
Communication - nature, process, networks, and barriers, Effective Communication.

UNIT-V Managerial Control : Concept and process; Effective control system; Technical control - traditional and modern. Management of Change : Concept, nature, and process of planned Resistance to change; Emerging horizons of management in a environment.

SUGGESTED READINGS :

1. Dr. R.C. Agrawal, Agra.
2. Dr. S.C. Saxena, Agra.
3. Weihrich and Koontz, et al : Essentials of Management; Tata McGraw Hill, New Delhi.

Group - III - PAPER – I

BUSINESS STATISTICS

Proposed Syllabus

OBJECTIVE

It enable the students to gain understanding of statistical techniques as are applicable to business.

UNIT-I Introduction : Statistics as a subject; Descriptive Statistics - compared to Inferential Statistics; Types of data; Summation operation; Rules of Sigma E operations, Analysis of University Data; Construction of a frequency distribution; Concept of central tendency.

UNIT-II Dispersion - and their measures; Partition values; Skewness and measures;

UNIT-III Analysis of Bivariate Data : Linear regression two variables and correlation.

UNIT-IV Index Number; Meaning, types, and uses; Methods of Constructing price and quantity indices (simple and aggregate); Tests of adequacy; Chain - base index numbers; Base shifting, splicing and deflating; Problems in constructing index numbers; Consumer price index. Analysis of Time Series : Cause of Variation in time series data; Components of a time series; Decomposition - Additive and Multiplicative models; Determination of trend - Moving Averages Method and method of least squares (including linear, second degree, parabolic, and exponential trend); Computation of seasonal indices by simple averages, ratio - to - trend, ratio - to - moving average, and link relative methods.

UNIT-V Forecasting and Methods : Forcasting - concept, types and importance; General approach to forecasting; Methods of forecasting; demand; Industry Vs Company sales forecast; Factors affecting company sales. Theory of Probability : as a concept; The three approaches to defining probability; Addition and multiplication laws of probability; Conditional Probability; Bayes' Theorem; Expectation and Variance of a random variable.

SUGGESTED READINGS :

1. S.M.Shukla, Shahitya Bhawan,Agara.

2. Statistical Analysis, Dr. Rajesh Shukla and J.B. Agrawal

Group - III PAPER – II

FUNDAMENTALS OF ENTREPRENEURSHIP

Proposed Syllabus

OBJECTIVE

It Provides exposure to the students to the entrepreneurial culture and industrial growth so as to preparing them to set up and manage their own small units.

UNIT-I Introduction : The entrepreneur; Definition; Emergence of entrepreneurial class; Theories of entrepreneurship; Role of socio - economic environment; Characteri-stics.

UNIT-II Promotion of a Venture; Opportunities analysis; External environmental analysis economic, social and technological; Competitive factors; Legal requirements for establishment of a new unit, and raising of funds; Venture capital sources and documentation required.

UNIT-III Entrepreneurial Behavior : Innovation and entrepreneur; Entrepreneurial behavior and Psycho - Theories, Social responsibility.

UNIT-IV Entrepreneurial Development Programs (EDP) : EDP, their role, relevance, and achievements; Role of Government in organizing EDPs; Critical evaluation.

UNIT-V Role of Entrepreneur : Role of an entrepreneur in economic growth as an innovator, generation of employment opportunities, complementing and supplementing economic growth, bringing about social stability and balanced regional development of industries; Role in export promotion and import substitution, forex earnings, and augmenting and meeting local demand.

SUGGESTED READINGS :

1. Srivastava S.B. : A Practical Guide to industrial Entrepreneurs; Sultan Chand and Sons, New Delhi.
2. Tandon B.C. : Environment and Entrepreneur; Chugh Publications, Allahabad.
3. Prasanna Chandra : Project Preparation, Appraisal, Implementation; Tata McGrow Hill, New Delhi.

COMPUTER APPLICATION

MARKSDISTRIBUTION PAPER – I

INTERNET APPLICATION & E-COMMERCE

Proposed Syllabus

UNIT - I **Introduction to HTML**

Introduction to Internet & World Wide Web

Internet- Indian and the Internet, Profile of Indian Surfer, History of the Internet, Indian Internet History, Technological Foundation of Internet, Application in Internet Environment, Movement of files/data between two computers, TCP/IP, IP Addresses, Domain Name System, Domain Name Services, allocation of second level domains in India, Internet & India.

World Wide Web (WWW) - WWW consortium browsing and Information retrieval, exploring the WWW, address : URL.

UNIT – II **Introduction to HTML & Designing Web Page**

Concept to Website, Web standards, What is HTML, HTML documents / file, HTML Editor, Explanation of the structure of Homepage, Elements in HTML Documents, HTML Elements, HTML Tags & Basic HTML Tags, viewing the source of web page & downloading the web page source, Extensible HTML, CSS, XML, XSL.

HTML Document Structure - Head Section

IIlustration of Document Structure, Mark-up elements within the Head : BASE,ISINDEX, LINK, META, TITLE, SCRIPT.

UNIT – III **HTML Document Structure & HTML Forms**

Body Section - IIlustration, Body elements, Background, TEXT BODY element, ADDRESS, BLOCKQUOTE, TABLE, COMMENTS, CHARACTER Emphasis modes, Logical styles, Physical Styles, FONT, BASEFONT and CENTER.

Image, Internal and External Linking

Between Web Pages - IMG Elements,

HEIGHT, WIDTH, ALT, ALLIGN, IIlustration of IMG elements, Hypertext Anchors, NAME attribute in Anchor.

HTML Forms - Forms, Form tag, Form

Structure, Input types, Drop down menu or select menu tags, image buttons.

UNIT – IV **Introduction to E-Commerce & Business Strategy in Electronic Age**

E-Commerce - Scope & definition of language, E-commerce & Trade cycle, E-markets, E-Data Interchange, Internet Commerce, E-commerce in Perspective.

Business Strategy - The value chain,

competitive advantage, business strategy, Case-Study : e-commerce in Passenger Air Transport.

UNIT – V **B to B e-Commerce & B to C e-Commerce Business to Business e-Commerce -** Inter- organisational Transactions, Electronic markets, Electronic Data Interchange (EDI) - the nuts and bolts, EDI and business, Inter roganizational e- Commerce.

Business to Consumer e-Commerce - Consumer

trade transactions.

The elements of e-Commerce - elements,

e-visibility, e-shop online payments, delivering the goods, after sales service, Internet e-Commerce Security A web site evaluation model.

e-Business - Introduction, Internet

Bookshops, Software Supplies & support, e-newspapers, internet banking, virtual auctions, online share dealing, gambling on net, e-diversity.

COMPUTER APPLICATION

PAPER – II

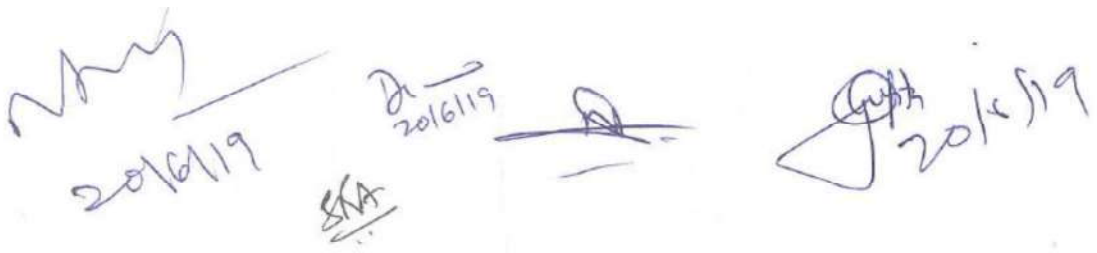
RELATIONAL DATABASE MANAGEMENT SYSTEM

Proposed Syllabus

UNIT – I **DATABASE SYSTEM CONCEPT & ENTITY RELATIONSHIP MODEL :**
Operational data, why database, data independence, an Architecture for a Data base system, DDL & DML, Data Dictionary, Data Structures and Corresponding Operators, Data Models, The Relational approach, The Network approach, DBMS storage structure and access method. Entity-Relationship model as a tool for conceptual design-entities attributes and relationaships. ER diagrams; strong and weak entities Generatization; Specialization and aggregation. Converting and ER-model into relational.

UNIT – II **Relational Database Management System Relational Model :**
Structure to Relational Database, Relational Algebra, The Domain Relational, Calculus, Extended Relational- Algebra Operation, Modification of database, Views. **Relational Database Design :-**
Pitfalls in Relational Database Design, Decomposition, Functional Dependencies, Normalization : INF,
2NF, BCNF, 3NF, 4NF, 5NF operations not involving
cursors, Operations involving cursors, dynamic statements, security & intergrity security specification in SQL.

UNIT – III **RELATIONAL DATABAWSE DESIGN :**
Relational Algebra, Traditional Set Operations, Attributes Names for Derived Relations, special relational operations, further normalization, functional dependence. First, second and third normal forms, BCNF Forms, relations with more than one candidate key, Good and bad decompositions, fourth normal form, fifth normal form, De-normalization.



UNIT – IV **Introduction to RDBMS Software - Oracle**

(a) Introduction : Introduction to personnel and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL * PLUS.

(b) DDL and DML : Creating Table, Specify Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting, Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

UNIT – V **(a) Security :** Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(b) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/S!L, Triggers in PL/SQL.

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हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 1458 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

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विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर के निम्नलिखित कक्षा/विषय के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से स्नातक के तीनों वर्ष के लिए लागू किया जाता है।

1. बी.कॉम. – आधार पाठ्यक्रम–हिन्दी भाषा एवं वाणिज्य।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार

कुलसचिव

क्र. 1459 /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 के परिपेक्ष्य में सूचनार्थ।
2. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

SYLLABUS

B.COM. PART-III

INDEX

Revised Ordinance No. 23 Scheme of Examination
Foundation Course I. Hindi Language II. English Language
Compulsory Groups
Group-I I. Income Tax II. Auditing
Group-II I. Indirect Taxes with GST II. Management Accounting
Group-III Optional **Option Group A (Finance Area)** I. Financial Management II. Financial Market Operations **Option Group B (Marketing Area)** I. Principles of Marketing II. International Marketing **Option Group C (Commercial Area)** I. Information Technology and its Applications in Business II. Essential of e-Commerce **Option Group D (Money Banking & Insurance Area)** I. Fundamental of Insurance II. Money & Banking System
Computer Application

REVISED ORDINANCE NO.-23

(As per State U.G.C. Scheme)

BACHELOR OF COMMERCE

1. The three year course has been broken up into three Parts.

   Part-I known as B. Com. Part-I Examination at the end of first year. Part-II Examination at the end of the second year, and,
   Part-III Examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of Chhattisgarh Board of Secondary Education, Raipur or any other examination recognized by the University or Chhattisgarh Board of Secondary Education as equivalent there to has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year, shall be eligible for appearing at the B.Com. Part-I examination.

3. A candidate who after passing B.Com. Part-I examination of the University or any other examination recognized by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-II Examination.

4. A candidate who after passing B.Com. Part-II examination of the University has completed a regular course of study for one academic year in an affiliated College or in the Teaching Department of the University, shall be eligible for appearing at the B.Com. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate students shall be eligible for admission to the examination as per provision of Ordinance No. 6 relating to examinations (General).

6. Provided that non-collegiate candidates shall be permitted to offer only such subject/ papers as are taught to the regular students at any of the University Teaching Department or College.

7. Every candidate for B.Com. Examination shall be examined in subjects as mentioned in the marking scheme and course or studies.

8. A candidate who has passed the B.Com. Part-III examination of the University shall be

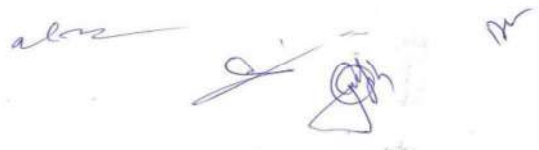
allowed to present him of examination in any of the additional subjects prescribed for the B.Com. Examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B. Com. Part-I examination in the subject which he proposes to offer then the B.Com. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

9. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total marks in each paper/group of subjects. In group where both theory and practical examinations are provided an examinee must pass in both theory and practical parts of examination separately.

10. Candidate will have to pass separately at the Part-I, Part-II and Part-III examination. No division shall be assigned on the result of the Part-I and Part-II examinations In determining the division of the Final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part-I examination.

11. Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject/group only, the total aggregate mark being carried over for determining the division, shall include actual marks obtained in the subject/group in which he appeared at the supplementary examination.

12. Successful examinees at the Part - III examination obtaining 60% or more marks shall be placed in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.



Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

SYLLABUS

B.COM. PART-III

GROUPING OF SUBJECTS AND SCHEME OF EXAMINATION

Subject		Max.	Min.
Foundation Course			
I. Hindi Language		**75**	**26**
II. English Language		**75**	**26**
Compulsory Groups			
Group-I			
I. Income Tax	**75**	**150**	**50**
II. Auditing	**75**		
Group-II			
I. Indirect Taxes with GST	**75**	**150**	**50**
II. Management Accounting	**75**		
Group-III Optional			
Option Group A (Finance Area)			
I. Financial Management	**75**	**150**	**50**
II. Financial Market Operations	**75**		
Option Group B (Marketing Area)			
I. Principles of Marketing	**75**	**150**	**50**
II. International Marketing	**75**		
Option Group C (Commercial Area)			
I. Information Technology and its Applications in Business	**75**	**150**	**50**
II. Essential of e-Commerce	**75**		
Option Group D (Money Banking & Insurance Area)			
I. Fundamental of Insurance	**75**	**150**	**50**
II. Money & Banking System	**75**		

(संशोधित पाठ्यक्रम)

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.
भाग – तीन, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा)
(पेपर कोड – 0231) पूर्णांक– 75

इकाई–एक **(क)** भारत माता : सुमित्रानंदन पंत

(ख) कथन की शैलियॉ

1. विवरणात्मक शैली
2. मूल्यांकन शैली
3. व्याख्यात्मक शैली
4. विचारात्मक शैली

इकाई–दो **(क)** सूखी डाली : उपेन्द्रनाथ अश्क

(ख) विभिन्न संरचनाएँ

1. विनम्रता सूचक संरचना
2. विधि सूचक संरचना
3. निषेध परक संरचना
4. काल–बोधक संरचना
5. स्थान–बोधक संरचना
6. दिशा बोधक संरचना
7. कार्य–कारण सम्बन्ध संरचना
8. अनुक्रम संरचना

इकाई–तीन **(क)** वसीयत : मालती जोशी

(ख) कार्यालयीन पत्र और आलेख

1. परिपत्र
2. आदेश
3. अधिसूचना
4. ज्ञापन
5. अनुस्मारक
6. पृष्ठाकंन

इकाई–चार **(क)** योग की शक्ति : हरिवंश राय बच्चन

(ख) अनुवाद : स्वरूप एवं परिभाषा, उद्देश्य
स्त्रोत भाषा और लक्ष्य भाषा,
अच्छे अनुवाद की विशेषताएँ,
अनुवाद प्रक्रिया, अनुवादक

इकाई–पांच **(क)** संस्कृति और राष्ट्रीय एकीकरण : योगेश अटल
(ख) घटनाओं, समारोहों आदि का प्रतिवेदन, विभिन्न प्रकार के निमंत्रण पत्र

मूल्यांकन योजना : प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरित विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे। इसलिए प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 अंक होंगे। प्रश्नपत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य –

निर्धारित पाठ का अध्ययन एवं हिन्दी भाषा प्रयोग की व्यवहारिक प्रणालियों से विधार्थियों को परिचित कराना तथा भाषा प्रयोग की सामान्य अशुद्धियों को दूर करने की दृष्टि से पाठ्यक्रम तैयार किया गया है। विधार्थियों के लिए पाठ्यक्रम का विस्तार बहुत ज्यादा न हो इसका ध्यान रखा गया है।

Foundation Course - III English

Language (Paper Code-1152)

B.A./B.Sc./B.Com./B.H.Sc./III

M.M. 75

The question paper for B.A./B.Sc./B.Com./B.H.Sc. III Foundation course, English Language and General Answers shall comprise the following items :

Five question to be attempted, each carrying 3 marks.

UNIT-I	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	15
UNIT-II	Essay writing	10
UNIT-III	Precise writing	10
UNIT-IV (a)	Reading comprehension of an unseen passage	05
(b)	Vocabulary based on text	10
UNIT-V	Grammar Advanced Exercises	25

Note: Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women and Worm in Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, the question of human social value, new Economic Philosophy Recent Diberaliation Method) Demoration decentralization (with reference to 73, 74 constitutional Amendment.

Books Prescribed:

Aspects of English Language and Development - Published by M.P. Hindi Granth Academy, Bhopal.

B.COM PART III

COMPULSORY CORE COURSE

TITLE OF PAPER - Group-I

PAPER – I - INCOME TAX

Proposed Syllabus

OBJECTIVE

It enables the students to know the basics of Income Tax Act and its implications.

M.M. 75

UNIT- I Basic Concepts: Income, agricultural Income, casual income, assessment year, previous year, gross total income, total income, person.

Basis of charge: Scope of total income, residence and tax liability, income whichdoes not form part of total income.

UNIT- II Heads of Income: Salaries; Income from house property.

UNIT- III Profit and gains of business or profession, including provisions relating to specificbusiness; Capital gains, Income from other sources.

UNIT-IV Computation of Tax Liabilty: Set-off and carry forward of losses; Deduction from grosstotal income.Aggregation of income; Computation of total income and tax liability of individualand& HUF.

UNIT-V Tax Management: Tax deduction at source; Advance payment of tax; Assessmentprocedures; Tax planning for individuals.

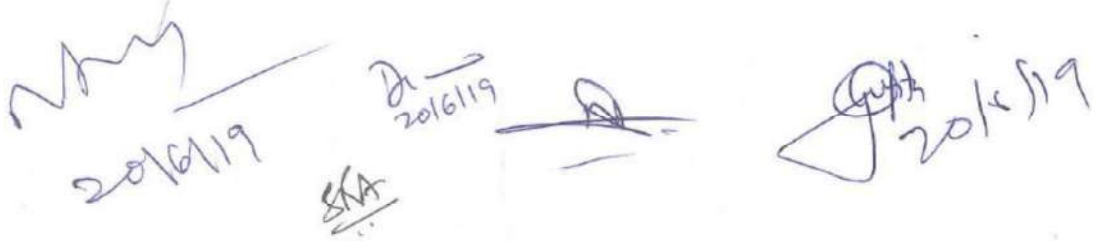
Tax evasion, Tax Avoidance and Tax planning. Tax Administration: Authorities, appeals, penalties.

Preparation of return of income

-Manually and on line

Suggested Reading:

1. Singhania V.K. : Students Guide to Income Tax; Taxmann, Delhi.
2. Prasad, Bhagwati : Income Tax Law &Prectice; Wily Publication, New Delhi.
3. Mehrotra H.C. : Income Tax Law & Accounts : SahityaBhawan, Agra.
4. Girish Ahuja and Ravi Gupta : Systematic approach to income tax :Sahitya Bhawan Publications, New Delhi.
5. Chandra Mahesh and Shukla D.C. : Income Tax Law and Practice; Pragati Publications, New Delhi.
6. R.K. Jain : Income Tax & Law (Hindi & English) ShahityaBhavan, Publication, Agra.



B.COM PART III

COMPULSORY CORE COURSE

TITLE OF PAPER - Group-I

PAPER – II- AUDITING

Proposed syllabus

OBJECTIVE

This course aims at imparting knowlege about the principles and methods of auditingand their applications.

M.M. 75

UNIT-I Introduction: Meaning and objectives of auditing; Types of audit; Internal audit.Audit Process: Audit programme; Audit note books; Working papers and evidences.

UNIT-II Internal Check System: Internal control.

Audit Procedure: Vouching: Verification of assets and liabilities.

UNIT-III Audit of Limited Companies:

a. Company auditor – Qualification, Appointment, powers, duties, Resignation and liabilities.
b. Divisible profits and dividend.
c. Auditor's report - standard report and qualified report.
d. Special audit of banking companies.
e. Audit of educational institutions.
f. Audit of Insurance companies.

UNIT-IV Investigation: Investigation; Audit of non profit companies,

a. Where fraud is suspected, and
b. When a running a business is proposed.
c. Varifications& Valuation of assets.

UNIT-V Recent Trends in Auditing : Nature and significance of cost audit; Tax audit; Management audit .

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Suggested Reading :

1. Gupta KaPal : Contemporary Auditing : Tata Mcgraw Hill, New Delhi.
2. Tandon B.N. : Principles of Auditing : S. Chand & Co., New Delhi.
3. PagareDinkar : Principles and Practice of Auditing : Sultan Chand, New Delhi.
4. Sharma T.R. : Auditing Principles and Problems, SahityaBhawan, Agra.
5. Shukla S.M. : Auditing - ShahityaBhavan, Agra, (Hindi)
6. Batliboy : Auditing.

B.COM PART III

COMPULSORY CORE COURSE

PAPER – II

Group-II -PAPER – I - INDIRECT TAXES WITH GST

Proposed syllabus

OBJECTIVE

This course aims at imparting basic knowlege about GST and apply the provisions of GST law to various situations.

M.M. 75

UNIT-I Customs : Role of customs in international trade; Important terms and definitionsgoods; Duty; Exporter; Foreign going vessel; Aircraft goods; Import; Import Manifest;

Importer; Prohibited goods; Shipping bill; Store; Bill of lading; Export manifest; Letter

of credit; Kinds of duties - basic, auxillary, additional or coutervailing; Basics of levyadvalorem,specific duties; Prohibition of export and import of goods, and provisions

regarding notified & specified goods; Import of goods - Free import and restrictedimport; Type of import - import of cargo, import of personal baggage, import ofstores.Clearance Procedure - For home consumption, for warehousing for re-export;Clearance procedure for import by post; Prohibited exports; Canalised exports; Export

against licensing; Type of exports export of cargo, export of baggage; Export of cargo by land, sea, and air routes.

UNIT-II State Excise, CENVAT. Detail study of State Excise during calculation of Tax.

UNIT-III INTRODUCTION TO GOODS AND SERVICES TAX (GST) -Objectives and basic scheme of GST, Meaning – Salient features of GST – Subsuming of taxes – Benefits of implementing GST , Structure of GST (Dual Model) – Central GST – State / Union Territory GST – Integrated GST

GST Council: Structures Power and Functions. Provisions fro amendments.

20/6/19 20/6/19 20/6/19

UNIT-IV Registration under GST: Procedure for registration, Persons liable for registration, Persons not liable for registration, Compulsory registration. Exempted goods and services - Rates of GST.
Procedure relating to Levy: (CGST & SGST): Scope of supply, Tax liability on Mixed and Composite supply, Time of supply of goods and services, Value of taxable supply.

Eway-Billing

UNIT-V ASSESSMENT AND RETURNS -
Input tax Credit: Eligibility, Apportionment, Inputs on capital goods, Distribution of credit by Input Service Distributor (ISD)
Furnishing details of outward supplies and inward supplies, First return, Annual return and Final return.

Suggested Reading :

1. Deloitte: GST Era Beckons, Wolters Kluwer.
2. Madhukar N Hiregange: Goods and Services Tax, Wolters Kluwer.
3. All About GST: V.S Datey - Taxman's.
4. Guide to GST: CA. Rajat Mohan,
5. Goods & Services Tax – Indian Journey: N.K. Gupta &SunnaniaBatia, Barat's Publication
6. Goods & Services Tax – CA. Rajat Mohan,
7. Goods & Services Tax: Dr. Sanjiv Agrawal & CA. Sanjeev Malhotra.
8. GST - Law & Practice: Dr. B.G. Bhaskara, Manjunath. N & Naveen Kumar IM,
9. Understanding GST: Kamal Garg, Barat's Publication.

B.COM PART III

COMPULSORY CORE COURSE

TITLE OF PAPER -Group-II

PAPER – II -MANAGEMENT ACCOUNTING

Proposed syllabus

OBJECTIVE

This course provides the students an understanding of the application of accounting techniques for management.

M.M. 75

UNIT-I Management Accounting : Meaning, nature, scope, and functions of managementAccounting; Role of managment accounting in decision making; Managementaccounting vs financial accounting; Tools and techniques of management accounting;Financial statement; Objectives and methods of financial statements analysis; Ratioanalysis; Classification of ratios - Profitability ratios, turnover ratios, liquidity ratios,turnover ratios; Advantages of ratio analysis; Limitations of accounting ratios.

UNIT-II Funds Flow Statement as per Indian Accounting Standard 3, cash flow statement.

UNIT-III Absorption and Marginal Costing : Marginal and differential costing as a tool fordecision making - make or buy; Change of product mix; Pricing, Break-even analysis;
Exploring new markets; Shutdown decisions.

UNIT-IV Budgeting for profit Planning and control : Meaning of budget and budgetary control;Objectives; Merits and limitations; Types of budgets; Fixed and flexible budgeting;
Control ratios; Zero base budgeting; Responsibility accounting; Performance budgeting.

UNIT-V Standard Costing and Variance Analysis : Meaning of standard cost and standardcosting; Advantages and application; Variance analysis - material; Labour and
overhead (Two-way analysis); Variances.

20/6/19 20/6/19 20/6/19

Suggested Reading :

1. Arora M.N. : Cost Accounting - Principles and Practice, Vikas, New Delhi.
2. Jain S.P. &Narang K.L. : Cost Accounting; Kalyani, New Delhi.
3. Anthony, Rogert& Reece, at al : Principles of Management Accounting; Richard Irwin Inc.
4. Horngren, Charles, Foster and Datar et al : Cost Accounting - A Managerial Emphasis;Prentice Hall, New Delhi.
5. Khan M.Y. and Jain P.K. : Management Accounting : Tata McGraw Hill, New Delhi.
6. Kaplan R.S. and Atkonson A.A. : Advanced Management Accounting; Printice Hall India,New Delhi.
7. J.K. Agrawal & R.K. Agrawal : Jaipur (English & Hindi).
8. Dr. M.R. Agrawal :MinakshiPrakashanMeruth.
9. Dr. S.P. Gupta - Agra (Hindi & English).

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B.COM PART III

OPTIONAL GROUP A (Finance Area)

TITLE OF PAPER - FINANCIAL MANAGEMENT

PAPER – I

Proposed syllabus

OBJECTIVE

The objective of this course is to help students understand the conceptual frameworkof financial management.

M.M. 75

UNIT-I Financial Management : Financial goals; Profit vs wealth maximization; Financial functions-investment, financing, and dividend decisions; Financial planning.

UNIT-II Capital Budgeting : Nature of investment decisions, Investment evaluation criteria,payback period, accounting rate of return, net present value, internal rate of return profitability index; NPV and IRR comparison.

UNIT-III Cost of Capital : Significance of cost of capital; Calculating cost of debt; Preference shares, equity capital, and retained earnings; Combined (weighted) cost of capital.Operating and financial Leverage : Their measure; Effects on profit, analyzing alternatefinancial plans, combined financial and operating leverage.

UNIT-IV Capital Structure: Theories and determinates. Dividend Policies: Issues in dividend policies; Walter's model; Gordon's model; M.M.Hypothesis, forms of dividends and stability in dividends, determinats.

UNIT-V Management of Working Capital: Nature of working capital, significance of workingcapital, operating cycle and factors determining of working capital requirements, Management of working capital - cash, recevables, and inventories.

20/6/19 20/6/19 20/6/19

Suggested Reading :

1. Van Home J.C. : Financial Management and Policy; Prentice Hall of India, New Delhi.
2. Khan M.Y. and Jain P.K. : Financial Management, Text and Problems; Tata McGrow Hill, New Delhi.
3. Prasanna Chandra L Financial Management Theory and practice; Tata McGrow Hill, New Delhi.
4. Pandey I.M. : Financial Management Vikas Publishing Hous, New Delhi.
5. Brigham E.F. Gapenski L.C., and Ehrhardt M.C. : Financial Management - Theory And Practice; Harcourt College Publishers, Singapore.
6. Bhalla V.K. : Modern Working Capital Management, Anmol Pub. Delhi.

B.COM PART III

OPTIONAL GROUP A (Finance Area)

TITLE OF PAPER - FINANCIAL MARKET OPERATIONS

PAPER – II

Proposed Syllabus

OBJECTIVE

This course aims at acquainting the students with the working of financial markets in India.

M.M. 75

UNIT-I Money Market : Indian money market's composition and structure; (a) Acceptance houses, (b) Discount houses and (c) Call money market; Recent trends in Indianmoney market.

UNIT-II Capital Market : Security market - (a) New issue market, (b) Secondary market; Functions and role of stock exchange; listing procedure and legal requirements; Public issue - pricing and marketing; Stock exchanges - National Stock Exchange ,Bombay stock exchange

UNIT-III Securities contract and Regulations Act : Main provgisions.Investors Protection : Grievancesconcerning stock exchange dealings and theirremoval; Grievance cells in stock exchanges; SEBI; Company Law Board; Press; Rmedy through courts.

UNIT-IV Functionaries on Stock Exchanges : Brokers, sub brokers, market makers, jobbers,portfolio consultants, institutional investors, and NRIs.

UNIT-V Financial Services : Marchant banking - Functions and roles; SEBI guide-lines; Creditrating - concept, functions, and types.

Suggested Reading :

1. Chandler M.V. and Goldfeld S.M. : Economics of money and Banking, Harper and Row,New Delhi.
2. Gupta Suraj B. Monetary Economics; s. chand and Co. New Delhi.
3. Gupta Suraj B. Monetary Planning in India; Oxford, Delhi.
4. Bhole L.M. : Financial Markets and Institutions : Tata McGrow Hill, New Delhi.
5. Hooda R.P. : Indian Securities Market - Investors view point; Excell Books, New Delhi.
6. R.B.I. : Functions and Working.
7. R.B.I. : Report in Currency and Finance.
8. R.B.I. : Report of the Committee to Review the working of the Monetary system Chakravarty committee.
9. R.B.I. : Report of the Committee on the Financial System, Narsimham Committee.

B.COM PART III
OPTIONAL GROUP B(Marketing Area)
TITLE OF PAPER -PRINCIPLES OF MARKETING
PAPER – I
Proposed syllabus

OBJECTIVE
The Objective of this course is to help students to understand the concept of marketing and its applications.

M.M. 75

UNIT-I Introduction : Nature and scope of marketing; Importnace of marketing as a businessfunction, and in the economy; Marketing concepts - traditional and modern; Sellingvs. marketing; Marketing mix; Marketing environment.

UNIT-II Consumer Behaviour and Market Segmentation : Nature, scope, and significance ofconsumer behaviour; Market segmentation - concept and importance; Bases for market segmentation.

UNIT-III Product : Concept of product, consumer, and industrial goods; Product planning anddevelopment; Packaging role and functions; Brand name and trade mark; after salesservice; Product life cycle concept. Price : Importance of price in the marketing mix; Factors affecting price of a product/service; Discounts and rebates.

UNIT-IV Distributions Channels and Physical Distribution; Distribution channels - Concept androle; Types of distribution channels. Factors affecting choice of a distribution channel;
Retailer and holesaler; Physical distribution of goods; Transportation, Warehousing, Inverntory control; Order processing.

UNIT-V Promotion : Methods of promotion; Optimum promotion mix; Advertising media – theirralative merits and limitations; Characteristics of an effective advertisement; Personalselling; Selling as a career; Classification of successful sales person; Functions ofsalesman.
Recent development in marketing –social marketing, online marketing, Direct marketing , Services marketing, Green marketing.

20/6/19 20/6/19 20/6/19

Suggested Reading :

1. Philip Kotler : Marketing Management Englewood Cliffs; Prentice Hall, N.J.
2. William M. Pride and O.C. Ferrell : Marketing : Houghton - Mifflin Boston.
3. Stanton W.J. Etzel Michael J., and Walker Bruce J. Fundamentals of Marketing; McGrawHill, New York.
4. Lamb Charies W., Hair Joseph F. and McDaniel Carl : Principles of Marketing; South-Western-Publishing, Cincinnati, Ohio.
5. Cravens David W. Hills Gerald E., Woodruff Robert B : Marketing management : RichardD. Inwin, Home wood Illinois.
6. Kotler Philip and Armstrong Gary : Principles of Marketing; Prentice Hall of India, New Delhi.
7. Dr. R.C. Agrawal, Agra.
8. Dr. S.C. Saxena Agra.
9. Dr. S.K. Jain, Hindi GranthAcademi. M.P.
10. Dr. N.C. jain

B.COM PART III

OPTIONAL GROUP B(Marketing Area)

TITLE OF PAPER -INTERNATIONAL MARKETING

PAPER – II

Proposed syllabus

OBJECTIVE

This course aims at acquainting student with the operations of marketing in internation alenvironment.

M.M. 75

UNIT-I International Marketing : Nature, definiton, and scope of international marketing;
Domestic marketing vs. International marketing; International environment externaland internal.

UNIT-II dentifying and Selecting Foreign Market: Foreign market entry mode decisions. Product Planning for international Market: Product designing; Standardization vs.adaptation; Branding and packaging; Labeling and quality issues; After sales service.International Pricing: Factors Influenceing International price; Pricing process-processand methods; International price quotation and payment terms.

UNIT-III Promotion of Product/Services Abroad: Methods of international promotion; Direct mail and sales literature; Advertising; Personal selling; Trade fairs and exhibitions.

UNIT-IV International Distribution: Distribution channels and logistics decisions; Selection and appointment of foreign sales agents.

UNIT-V Export Policy and Practices in India: Exim policy - an overview; Trends in India'sforeign trade; Steps in starting an export business; Product selection; Market
selection; Export pricing; Export finance; Documentation; Export procedures; Export
assistance and incentives.
Marketing Control Process

Suggested Reading :

1. Bhattacharya R.L. and Varshney B. : International Mrketing Management; Sultan Chand, New Delhi.
2. Bhattacharya B. : Export Marketing Strategles for Success; Global Press, New Delhi.
3. Keegan W.J. : Multinational Marketing Management; Prentice Hall, New Delhi.
4. Kriplani V. : International marketing; Prentice Hall New Delhi.
5. Taggart J.H. and Moder Mott. M.C.: The Essence of International Business; Prentice Hall New Delhi.
6. Kotler Phillip : Principles of Marketing; Prentice Hall New Delhi.
7. Fayer Weather John : International Marketing; Prentice Hall N.J.
8. Caterora P.M. and Keavenay S.M.: Marketing an international Perspective; Erwin Homewood, Illinois.
9. Paliwala, Stanely J. The Essence of International marketing; Prentice Hall, New Delhi.

B.COM PART III

OPTIONAL GROUP C(Commercial Area)

TITLE OF PAPER - INFORMATION TECHNOLOGY AND ITS APPLICATIONS IN BUSINESS

PAPER – I

Proposed syllabus

OBJECTIVE

The objective of the course is to famillatize the students with the innovation informationtechnology and how it affects business. An understanding of the group rules of thesetechnologies will enable the students to appreciate the nitty-gritty Commerce.

M.M. 75

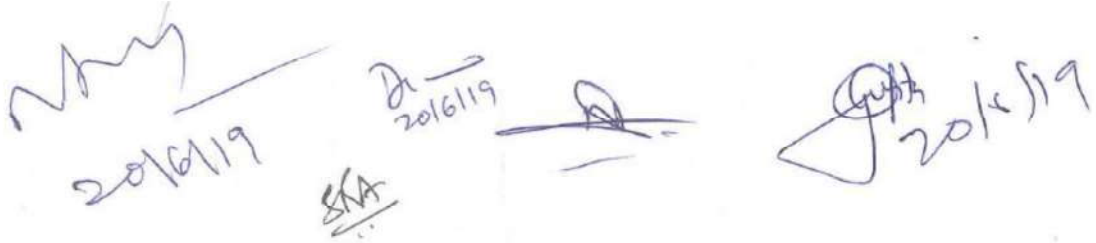
UNIT-I Information Revolution and information Technology (IT) : Deployment of Business;Basic features of IT; Impact of IT on business environment and social fabric; Inventionof writing; Written books; Printing Press and movable type Gutenberg's invention;Radio; telephone, wireless and satelite communication computing and disseminationof information and knowledge and convergence technologies (Internet with Wireless-WAP).

UNIT-II Fundamentals of Computer: Data, information and EDP : Data, information and concept of data and information; Levels of information from data; processing;Electronic data processing; Electronic machines;

a. Number Systems and Codes: Different number systems - binary, octal decimal,
hexagonal, and their conversion codes used in computers; Bed, EBCDIC, ASCII;Gray and conversions.

b. Computer Arithmetic and Gates : Binary arithmetic, complements, addition
subtraction; Conversion from one system to another; Logic Gates, truthtable and applicationsminimisation, and K-maps.

c. Computer Processing System : Definition of computer; Hardware/Software
concepts; Generation of computers; Types of computers; Elements of computer;CPU and its functions, Various computer systems.



d. I/O devices : Basic concepts of I/O devices; Various input devices Keyboard,mouse; MICR, OCR, microphones.

e. Various output devices : VDU, printer, plotter,spooling, L.S.

f. Storage Devices : Primary and secondary memory; Types of memory capacityand its enhancement; Memory devices and comparisons; Auxiliary storage,tapes, disks (magnetic and potical); various devices and their comparison.

g. System Software - Roale of Software, Different System Software :O.S.,utilization element of O.S. - Its types and variations; DOS and windows.

h. Computer and Networks : Need of communication; Data transmission; Baud;

Bandwidth; Communication Channel; Multiplexing; Basic network concepts;O.S.I. model; Types of topologies; LAN, WAN, Client server concept.

UNIT-III Computer-based Business Applications

a. Word Processing : Meaning and role of word processing in creating of documents, editing, formatting, and printing documents, using tools such as spelling check, thesaurus, etc. in word processors (MS-Word).

d. Electronic Spreadsheet : Structure of spreadsheet and its applications to accounting, finance, and marketing functions of business; Crating a dynamic/sensitive worksheet; Concept of absolute and relative cell reference; Using builtinfunctions; Goal seeking and solver tool; Using graphics and formatting of

worksheet; Sharing data with other desktop applications; Strategies of cratingerror-free worksheet (MS-Excel, Lotus 123). Practical knowledge on WingsAccounting (Software).

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c. Programming under a DBMS environment : The concept of data basemanagement system; Data field, records, and files, Sorting and indexing data;Searching records, designing queries, and reports; Linking of data files;Understanding programming environment in DBMS; Developing menu drivenapplications in query language (MS-Access).

UNIT-IV Electronic Data Interchange (EDI)
Introduction to EDI; Basics of EDI; EDI standards; Financial EDI (FEDI); FEDI for international trade transaction; Applications of EDI; Advantages of EDI; Future of EDI.

UNIT-V The Internet and its Basic ConceptsInternet-concept, history development in India; Technological foundation of internet;

Distributed computing; Client-server computing; Internet protocol suite; Application of distributed computing; Client-server computing; Internet protocol suite in the internet
environment; Domain Name System (DNS(; Domain Name Service (DNS); Generic
top-lelveldomian (gTLD); Country code top-level domain (ccTLD); - India; Llocation of second-level doomains; IP addresses; Internet protocol; Applications of Internet

in business, education, governance, etc.Information System AuditBasic idea of information audit; Difference with the traditional concepts of audit;Conduct and applications of IS audit in internet environment.

Suggested Reading :

1. AgrawalaKamlesh N. and AgarwalaDeeksha : Business on the Net - Introduction to Ecommerce, Macmillan India, New Delhi.
2. AgarwalaKamlesh, N. and Agarwala Deeksha : Bulls, Bears and The mouse; and introduction to On-line Service Market Trading; Macmillan India, New Delhi.
2. AgarwalaKamlesh, N. and AgarwalaPrateek Amar; WAP the Net; An Introduction on Wireless Application Protocol; Macmillan India, New Delhi.
3. Bajaj Kamlesh K. and Nag Debjanl : E-Commerce; The cutting Edge of Business; Tata McGraw Hill, New Delhi.
4. Edwards, Ward and Bytheway : The Essence of Information Systems; Prentice Hall, NewDelhi.
5. Garg &Srinivasan : Work Book on Systems Analysis & Design; Prentice Hall New Delhi.
7. Kanter : Managing with Information; Prentice Hall New Delhi.
8. Minoli Daniel, MinoliEmma : Web Commerce Technology Handbook; Tata McGraw Hill, New Delhi.
9. MinoliDaniel : Internet & Internet Engineering; Tata McGrow Hill, New Delhi.
10. Yeats : Systems Analysis & Design; Macmillan India, New Delhi.
11. Goyal : Management information System; Macmillan India, New Delhi.
12. Timothi J O'Leary : Microsoft Office 2000; Tata McGrow Hill, New Delhi.

B.COM PART III

OPTIONAL GROUP C (E-Commerce Area)

TITLE OF PAPER -ESSENTIAL OF E-COMMERCE

PAPER – II

Proposed syllabus

OBJECTIVE

The objective of this course is to familiarize the students with the basics of e-commerce and to comprehend its potential.

M.M. 75

UNIT-I Internet and Commerce : Business operations; E-Commerce practices; Concepts b2b,b2c, b2g, g2h; Benefits of e commerce to organization, consumers, and society;
Limitation of e-commerce; Management issues relating to e-commerce.
Operations of E-Commerce : Credit card transaction; Secure Hypertext Transfer
Protocol (SHTP); Electronic payment systems; Secure electronic transaction (SET);
Set's encryption; Process; Cybercash; Smart cards; Indian payment models.

UNIT-II Applications in B2C : Consumer's shopping procedure on the internet; Impact on disintermediation and re-inermediation; Global market; Strategy of traditional
department stores; Products in b2c model; Success factors of e-brokers; Broker based
services on-line; Online travel tourism services; Benefits and impact of e-commerce
on travel industry; Real estate market; Online stock trading and its benefits; Online
banking and its benefits; Online financial services and their future; Educations
benefits, implementation, and impact.

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UNIT-III Applications in B2B; Applications of b2b, Key technologies for b2b; Architectural
models of b2b; Characteristics of the supplier-oriented marketplace, buyer-oriented
marketplace, and intermediary-oriented marketplace; Benefits of b2b on procurement
re-engineering; Just in Time delivery in b2b; Internet-based EDI from traditional EDI;
Integrating EC with back-end information systems; Marketing issues in b2b.

UNIT-IV Applications in Governance: EDI in governance; E-government; E-governance applications of the internet; Concept of government to business, business to government and citizen-to-government; E-governance models; Private sector interfacein e-governance.

UNIT-V Emerging Business Models : Retail model; Media model; Advisory model, Mode-toordermanufacturing model; Do-it yourself model; Information service model; Emergin
hybrid models; Emerging models in India.
Security and Legal aspects of E-commerce.

Suggested Reading:

1. AgarwalaKamlesh. N. and AgarwalaDeekhsa: Bridge to Online Storefornt; MacmillanIndia, New Delhi.
2. AgarwalaKamlesh. N. and AgarwalaDeeksha: Business on the Net Introduction to theE-commerce; Macmillan India New Delhi.
3. AgarwalaKamlesh N. and AgarwalaDeeksha: Bulls, Bears and TheMouse: AnIntroduction to Online Stock Market Trading; Macmillan India New Delhi.
4. Tiwari Dr. Murli D.:Eductaion and E-Governance; Macmillan India, New Delhi.
5. Minoli Daniel, MinoliEmma: Web Commerce Technology Handbook; Tata McGraw Hill,New Delhi.
6. MinoliDeniel, Internet & Internet Engineering: Tata McGrow Hill, 1999.
7. BhatnagarSubhash and Schware Robert (Eds): Information and CommunicationTechnology in Development; Sage Publications India, New Delhi.
7. Amor, Daniel: E-business R evealuation, The : Living and Working in an InterconnectedWorld; Prentice Hall, U.S.
8. Afuah, A., and Tuccu, C.: Internet usiness models and Strategies; McGraw Hill, New York.

B.COM PART III

OPTIONAL GROUP D (Money Banking & Insurance Area)

TITLE OF PAPER FUNDAMENTAL OF INSURANCE

PAPER – I

Proposed syllabus

OBJECTIVE

This course enables the students to know the fundamentals of insurance.

M.M. 75

UNIT-I Introduction to Insurance: Purpose and need of insurance; Insurance as a social security tool; Insurance and economic development.

UNIT-II Fundamentals of Agency Law: Definiton of an agent; Agents regulations; Insurance intermediaries; Agents compensation.

UNIT-III Procedure for Becoming an Agent : Prerequisite for obtaining a license; Duration of license; Cancellation of incense; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions of the Agent : Proposal form and other forms for grant of cover; Financial and medical underwriting ; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

UNIT-IV Company Profile : organizational set-up of the company; Promotion strategy; Market share; Important activities; Structure; Product; Actuarial profession; Product pricing actuarial aspects; Distribution channels.

UNIT-V Fundamentals/Principles of Life insurance/ Marine /Fire /Medical/General Insurance; Contracts of various kinds; Insurable Interest.

Online insurance procedure

Suggested Reading :

1. Mishra M.N. : Insurance Principle and Practice; S. Chand and Co., New Delhi.
2. Insurance Regulatory Development Act. 1999.
3. Life Insurance Corporation Act. 1956.
4. Gupta OS : Life Insurance; Frank brothers, New Delhi.
5. Vinayakam N., Radhaswamy and VasudevanSV : Insurance - Principles and Practice,
S. Chand and Co. New Delhi.
6. Mishra MN : Life Insurance Corporation of India, Vols I, II & III; Raj Books, Jaipur.
7. BalchandShriwastava, Agra.
8. Dr. M.L. Singhai, RAmesh Book Depot, Jaipur.

B.COM PART III

OPTIONAL GROUP D (Money Banking & Insurance Area)

TITLE OF PAPER - MONEY & BANKING SYSTEM

PAPER –II

Proposed Syllabus

OBJECTIVE

This course enables the students to know the working of the Indian Money & banking system.

M.M. 75

UNIT-I Money: Function, Alternative Measures tomoney supply in India - their differentcomponents. Meaning and changing relative importance of each.

UNIT-II Indian Banking System : Structure and organization of banks; Reserve Bank of India;Apex banking Institutions; Commercial banks; Regional rural banks; Cooperativebanks; Development banks.

UNIT-III Banking Regulation Act, 1947 : History; Social control; Banking Regulation Act asapplicable to banking companies and public sector banks; Banking Regulation Act asapplicable to Cooperative banks.

UNIT-IV Regional Rural and Cooperative Banks in India: Functions; Role of regional rural andcooperative banks in rural India; Progress and performance.

UNIT-V Reserve Bank of India: Objectives; Organization; Functions and working; Monetarypolicy; Credit control measures and their effectiveness.

State Bank of India, Project History, Objectives, Functions & Organization working& progress.

Internet banking system

Suggested Reading:

1. Basu A.K.: Fundamentals of Banking-Theory and Practice; A Mukherjee and Co., Calcutta.
2. Sayers R.S.: Modern Banking: Oxford University Press.
3. Panandikar S.G. And Mithani D.M.: Banking in India; orient Longman.
4. Reserve Bank of India: Functions and Working.
5. Dekock: Central Banking; Crosby lockwood Staples, London.
6. Tannan M.L. : Banking - Law and Practice in India : India Law House, New Delhi.
7. Knubchandani B.S.: Practice and Law of Banking; Macmillan, New Delhi.
8. Shekhar and Shekhar: Banking Theory and Practice; Vikas Publishing House, New Delhi.
9. Harishchandra Sharma.
10. M.L. Singhai.

B.Com-III

PAPER - I

PROGRAMMING IN VISUAL BASIC

(Paper Code-1165)

UNIT-I Introduction to Visual Basic, Programs, Variables

Editions of Visual Basic, Event Driven Programming, Terminology, Working environment, project and executable files, Understanding modules, Using the code editor window, Other code navigation features, Code documentation and formatting, environment options, code formatting option automatic code completion features. Introduction to objects, Controlling objects, Properties, methods and events, Working with forms, interacting with the user: MsgBox function, InputBox function, Code statements, Managing forms, Creating a program in Visual Basic, Printing, Overview of variables, User-defined data types, constants working with procedures, Working with dates and times, Using the Format Function, Manipulating text string.

UNIT-II Controlling Program Execution, Working with Control

Comparison and logical operators, If....Them statements, Select Case Statements looping structures, Using Do....Loop structures, For....Next statement, Exiting a loop. Types of controls, Overview of standard controls, ComboBox and ListBox, OptionButton and Frame controls Menu, Status bars, Toolbars, Advanced standard controls, ActiveX controls, Insertable objects, Arrays, Dynamic Arrays.

UNIT-III Procedure, Function Error Trapping & Debugging

Procedure, Function, call by value, call by reference, Type definition, with object, Validation, Overview of run-time errors, error handling process, The Error object, Errors and calling chain, Errors in an error-handling routine, Inline error handling, Error handling styles, General error-trapping options Type of errors, Break mode Debug toolbar, Watch window, Immediate window, Local window, Tracing Program flow with the Call Stack.

UNIT-IV Sequential and Random Files :

Saving data to file, basic filling, data analysis and file, the extended text editor, File organization Random access file, The design and coding, File Dialog Box, Picture Box, Image box, Dialog Box, using clipboard, Copy, Cut, Paste of Text & Picture in Clipboard, Use of Grid Control Multiple document interface, Single document interface.

UNIT-V Data Access Unsing the ADO Data Control & Report Generation

Overview of ActiveX data Objects, Visual Basic data access features, Relational database concepts Using the ADO Data control to access data, Overview of DAO, RDO, Data Control, structured query language (SQL), Manipulating data Using Data Form Wizard. Overview of Report, Data Report, Add groups, Data Environment, Connection to database Introduction to Crystal Report Generator.

BOOK REFERENCE :

1. Visual Basic Programming – Reeta Sahu, B.P.B. Publication.
2. Mastering in Visual Basic - By BPB Publications.
3. Visual Basic Programming - Mark Brit.

B.Com-III

PAPER - II

SYSTEM ANALYSIS, DESING & MIS

(Paper Code-1166)

UNIT-I Introduction -

Systems Concepts and the information systems environment : Definition of system, Characteristics of system, elements of system, types of system, The system Development life cycle : consideration of candidates system. The Role of system Analyst : Introduction, the multiphase role of the analyst, the analyst / user interface, the place of the analyst in the MIS Organization

UNIT-II System Analysis, Tools of Structured Analysis, Feasibility Study-

System Planning and initial investigation : Basis for planning in systems analysis, initial investigation, fact finding, fact analysis, determination of feasibility.

Information Gathering : Kind of information, Information gathering tools.

Structured Analysis, Flow chart, DFD, Data Dictionary, Decision Tree, Structured English, Decision Table. System Performance, Feasibility Study. Data Analysis.

UNIT-III System Design & System Implementation -

The process of Design Methodologies. Input Design, Output Design, Form Design, File Structure, File organization, data base design, System Testing, the test plan, quality assurance, data processing auditor. Conversion, Post implementation review, Software Maintenance.

UNIT-IV Introduction to MIS & Other Subsystem-

Evolution of MIS, Need of MIS, Definition & Benefits of MIS, Characteristic, Role component of Information system, data base as a future of MIS, Decision making, logic of Management Information system, Structure of MIS.

UNIT-V Information System Concept -

Difference between Transaction Processing. System (TPS) and Management Information System, How MIS works, MIS and Information Resource Management, Quality information Building Blocks for the information system, information system concept, Other system characteristic (Open & Closed System), difference between MIS & Strategic System, Adaptive system, Business function information system.

BOOK REFERENCE :

1. System Analysis and Design - Elias M. Awad.
2. System Analysis and Design - Alan Dennis & Barbara Haley Wixo.
3. Management Information systems - C.S.V. Murthy, Himalaya Publication House.

B.Com-III

PAPER – III

PRACTICAL EXERCISES BASED ON PAPER I & II

Practicals to be done –

1. At least 20 practical - exercises covering the contents of paper - I (e.g. Designing calculator, sorting of elements, Generating Fibonacci series)
2. Design the Project on one of the following - Application Software / Website Design/Accounting software / Inventory control System / System Software &other (e.g. Library Management System, Medical management, Stock Management, Hotel Management, Website for your institute / Website of any Organization)
3. The Project Report cover the following topic - Objective, Hardware & Software Requirements, Analysis, Design, Coding, input forms, testing, Reports, Future enhancement of s/w.
4. Practical exam is based on the Project Demonstration & report.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. १५६० /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–एक के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

——00——

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–एक के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से लागू किये जाते हैं:–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी, प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान, लाईब्रेरी साईंस
2. बी.एस–सी. – आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.एस.सी– (गृह विज्ञान) आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. विधि – एल.एल.बी.
5. प्रबंध – बी.बी.ए.

उपरोक्त विषयों को शिक्षा सत्र 2019–20 से संशोधित रूप में स्नातक स्तर भाग–एक के लिए लागू किया जाता है स्नातक स्तर भाग दो एवं तीन के पाठ्यक्रम यथावत रहेंगे।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार।

कुलसचिव

B.Sc.Part-I
विषय–सूची

1. Revised Ordinance No. 21
2. Scheme of Examination
3. Environmental Studies
4. Foundation Course :आधार पाठ्यक्रम

   प्रथम हिन्दी

   द्वितीय –अंग्रेजी भाषा

   Physics (भौतिक शास्त्र)
6. Chemistry (रासायन शास्त्र)
7. Zoology (प्राणी शास्त्र)
8. Botany (वनस्पति शास्त्र)
9. Mathematics (गणित)
10. Microbiology (सूक्ष्म जीव विज्ञान)
11. Geology (भू – विज्ञान)
12. Anthropology (मानव विज्ञान)
13. Statistics (सांख्यिकी)
14. Defense Studies (रक्षा अध्ययन)
15. Industrial Chemistry (औद्योगिक रसायन)
16 Computer Science
17. Electronics Equipment Maintenance
18. Electronics
19. Information Technologies
20. Industrial Microbiology
21. Bio Chemistry
22. Biotechnology

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-Ii examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognized by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-I examination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognized by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-II examination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-III examination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department or College.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

      1. Physics, Chemistry &Mathematics.
      2. Chemistry, Botany &Zoology.
      3. Chemistry, Physics &Geology.
      4. Chemistry, Botany &Geology.
      5. Chemistry, Zoology &Geology.
      6. Geology, Physics &Mathematics.
      7. Chemistry, Mathematics &Geology.
      8. Chemistry, Botany & Defense Studies.
      9. Chemistry, Zoology & Defense Studies
      10. Physics, Mathematics & Defense Studies.
      11. Chemistry, Geology & Defense Studies

12. Physics, Mathematics &Statistics
13. Physics, Chemistry &Statistics
14. Chemistry, Mathematics &Statistics.
15. Chemistry, Zoology &Anthropology.
16. Chemistry, Botany &Anthropology.
17. Chemistry, Geology &Anthropology.
18. Chemistry, Mathematics &Statistics.
19. Chemistry, Anthropology & Defense Studies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defense Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & Applied Statistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & Computer Application
27. Chemistry, Mathematics & Computer Application
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & Environmental Biology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry, Botany
38. Chemistry, Biochemistry, Zoology
39. Chemistry, Biochemistry, Microbiology
40. Chemistry, Biotechnology, Botany
41. Chemistry, Biotechnology, Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for core subjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementary examination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

SCHEME OF EXAMINATION

Subject	Paper	Max. Mark	Total Marks	Min. Marks
Environmental Studies		**75**	**100**	**33**
Field Work		**25**		
Foundation Course				
Hindi Language	I	75	75	26
English Language	I	75	75	26

नोट– प्रत्येक खंड में से 2 दो प्रश्न हल करने होंगे। सभी प्रश्नपत्र समान अंक के होगें।

Three Elective Subject:

1.	Physics	I	50		
		II	50	100	33
		Practical		50	17
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50		
		II	50	100	33
		Practical		50	17
5.	Zoology	I	50		
		II	50	100	33
		Practical		50	17
6.	Geology	I	50		

	II	50	100	33
	Practical		50	17
7. Statistics	I	50		
	II	50	100	33
	Practical		50	17
8. Anthropology	I	50		
	II	50	100	33
	Practical		50	17

Subject	Paper	Max. Marks	Total Marks	Min. Marks
9. Defense Studies	I	50		
	II	50	100	33
	Practical		50	17
10. Micro Biology	I	50		
	II	50	100	33
	Practical		50	17
11. Computer Science	I	50		
	II	50	100	33
	Practical		50	17
12. Information Technology	I	50		
	II	50	100	33
	Practical		50	17
13. Industrial Chemistry	I	34		
	I	33	100	33
	II	33		
	Practical		50	17
14. Bio Chemistry	I	50		
	II	50	100	33
	Practical		50	17
15. Bio Technology	I	50		
	II	50	100	33
	Practical		50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memory and following variables be permitted +, –, x, , square, reciprocal, exponentials log, square root, trigonometric functions, wize, sine, cosine, tangent etc. factorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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Part - I

SYLLABUS FORENVIRONMENTAL STUDIES AND HUMAN RIGHTS
(Paper code-0828)

MM. 75

इन्वायरमेंटल साईंसेस के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है। स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न–पत्र उत्तीर्ण करना अनिवार्य है। तभी उपाधि प्रदाय योग्य होगी।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होंगे एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होंगे।

सैद्धांतिक प्रश्नों पर अंक – 75 (सभी प्रश्न इकाई आधार पर रहेंगे जिसमें विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक
(ब) निबंधात्मक – 50 अंक

Field Work- 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा। अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं केसमान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेंगे।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा केसाथ किया जाएगा।पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी। पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क के संयुक्त रूप से 33ः (तैंतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे।

UNIT-I THE MULTI DISCIPLINARY NATUREOF ENVIRONMENTALSTUDIES

Definition, Scope and

Importance Natural Resources:

Renewable and Nonrenewable Resources

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging ,salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

(12 Lecture)

UNIT-II ECOSYSTEM

(a) Concept, Structure and Function of and ecosystem

- Producers, consumers and decomposers.
- Energy flow in thee co system
- Ecological succession
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristics Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecosystem.

(b) Biodiversity and its Conservation

- Introduction - Definition: genetic. species and ecosystem diversity
- Bio-geographical classification of India.
- Value of biodiversity: Consumptive use. Productive use, social ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.

- Hot spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

(12Lecture)

UNIT- III

(a) Causes, effect and control measures of

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(12Lecture)

(b) Environmental Management

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, water shed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
- Wasteland reclamation
- Environment protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and Human Health.

UNIT- IV

General background and historical perspective- Historical development and concept of Human Rights, Meaning and definition of Human Rights, Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter, protection of Human Rights under the Universal Declaration of Human Rights, 1948.

Convention on the Elimination of all forms of Discrimination against women.

Convention on the Rights of the Child, 1989.

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution ofIndia, Directive Principles of State policy under the Constitution of India, Enforcement of Human Rights in India.

Protection of Human Rights under the Human Rights Act, 1993- National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India.

Reference/ Books Recommended

1. SK Kapoor- Human rights under International Law and IndianLaw.
2. HO Agrawal- Internation Law and HumanRights
3. एस.के. कपूर —मानव अधिकार
4. जे.एन. पान्डेय — भारत का संविधान
5. एम.डी. चतुर्वेदी —भारत का संविधान
6. J.N.Pandey - Constitutional Law ofIndia
7. Agarwal K.C. 2001 Environmental Biology, Nidi pub. Ltd.Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin pub. Ltd. Ahmedabad 380013,India, Email:mapin@icenet.net(R)
9. Bruinner R.C. 1989, Hazardous Waste Incineration. McGraw HillInc.480p
10. Clark R.S. Marine pollution, Clanderson press Oxford(TB)
11. Cuningham, W.P.Cooper. T.H.Gorhani, E & Hepworth.M.T,200
12. Dr. A.K.- Environmental Chemistry. Wiley EasternLtd.
13. Down to Earth, Center for Science and Environment(R)
14. Gloick, H.P. 1993 Water in crisis. pacific institute for studies in Deve. Environment& Security. Stockholm Eng. Institute. Oxford University, Press. m473p.
15. Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Mumbai(R)
16. Heywood, V.H. & Watson, T.T.1995 Global Biodiversity Assessment, Cambridge Univ. Press1140p
17. Jadhav H. & Bhosale, V.H. 1995 Environmental Protection and Law. Himalayapub. House, Delhi284p
18. Mckinney M.L.& School R.M.1996, environmental Science systems & solutions,web enhanced edition,639p
19. Mhadkar A.K. Matter Hazardous, Techno-Sciencepublication(TB)
20. Miller T.G.Jr. Environment Science, Wadsworth publication co.(TB)
21. Odum E.P.1971, Fundamentals of Ecology, W.B. Saunders Co.USA,574p
22. Rao M.N. & Datta, A.K. 1987, Waste water treatment. Oxford & IBH pub.co.pvt.Ltd 345p
23. Sharma B.K. 2001, Environmental chemistry, Goel pub. House,Meerut
24. Survey of the Environment, TheHidu(M)
25. Townsend C. Harper J. And Michael Begon, Essentials of Ecology, Blackwell Science(TB)
26. Trivedi R.K.Handbook of Environment Laws, Rules, Guidlines, Compliancesand Standards, Vol land II, EnvironmentMedia(R)
27. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science publication (TB)
28. Wanger K.D.1998, Environmental Management. W.B. Saunders Co. Philadelphia,USA 499p

संशोधित पाठ्यक्रम

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.

भाग – एक (आधार पाठ्यक्रम)

प्रश्न पत्र– प्रथम (हिन्दी भाषा)

(पेपर कोड –0101) पूर्णांक– 75

नोट :–

1. प्रश्न पत्र 75 अंक का होगा।
2. प्रश्न पत्र अनिवार्य होगा ।
3. इसके अंक श्रेणी निर्धारण के लिए जोड़े जायेंगे।
4. प्रत्येक इकाई के अंक समान होंगे।

पाठ्य विषय :–

इकाई–1

क. पल्लवन, पत्राचार, अनुवाद, पारिभाषिक शब्दावली एवं हिंदी में पदनाम

ख. ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई–2

क. शब्द शुद्धि, वाक्य शुद्धि, शब्द ज्ञान–पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द एवं मुहावरे–लोकोक्तियाँ

ख. भारत वंदना (कविता)– सूर्यकान्त त्रिपाठी निराला

इकाई–3

क. देवनागरी लिपि – नामकरण, स्वरूप एवं देवनागरी लिपि की विशेषताएँ, हिंदी अपठित गद्यांश, संक्षेपण, हिंदी में संक्षिप्तीकरण

ख. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई

इकाई–4

क. कम्प्यूटर का परिचय एवं कम्प्यूटर में हिंदी का अनुप्रयोग

ख. शिकागो से स्वामी विवेकानंद का पत्र

इकाई–5

क. मानक हिन्दी भाषा का अर्थ, स्वरूप, विशेषताएँ, मानक, उपमानक, अमानक भाषा

ख. सामाजिक गतिशीलता – प्राचीन काल, मध्यकाल, आधुनिक काल

मूल्यांकन योजना :–

प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 होंगे। प्रश्न–पत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य :–

व्याकरण के बुनियादी ज्ञान, संप्रेषण, कौशल, सामाजिक संदेश एवं भाषायी दक्षता को ध्यान में रखते हुए यह पाठ्यक्रम प्रस्तावित है।

FOUNDATION COURSE

PAPER - II

ENGLISH LANGUAGE **M.M. 75**

(Paper code - 0792)

UNIT-1 **Basic Language skills : Grammar and Usage.**

Grammar and Vocabulary based on the prescribed text.
To be assessed by objective / multiple choice tests.

(Grammar - 20 Marks
Vocabulary - 15 Marks)

UNIT-2 **Comprehension of an unseen passage.** **05**

This should simply not only (a) an understanding of the passage in question, but also.
(b) a grasp of general language skills and issues with reference to words and usage within the passage and (c) the Power of short independent composition based on themes and issues raised in the passage.
To be assessed by both objective multiple choice and short answer type tests.

UNIT-3 **Composition :** Paragraph writing **10**

UNIT-4 **Letter writing** (The formal and one Informal) **10**

Two letters to be attempted of 5 marks each. One formal and one informal.

UNIT-5 **Texts :** **15**

Short prose pieces (Fiction and not fiction) short poems, the pieces should cover a range of authors, subjects and contexts. With poetry if may sometimes be advisable to include pieces from earlier periods, which are often simpler than modern examples. In all cases, the language should be accessible (with a minimum of explanation and reference to standard dictionaries) to the general body of students schooled in the medium of an Indian language.

Students should be able to grasp the contents of each place ; explain specific words, phrases and allusions; and comment on general points of narrative or argument. Formal Principles of Literary criticism should not be taken up at this stage.

To be assessed by five short answers of three marks each.

BOOKS PRESCRIBED -

English Language and Indian Culture - Published by M.P. Hindi Grant Academy Bhopal.

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Dr. M. Chakraborty DR. MERILY ROY

Session
2019-20

PHYSICS

OBJECTIVES OF THE COURSE

The undergraduate training in physics is aimed at providing the necessary inputs so as to set forth the task of bringing about new and innovative ideas/concepts so that the formulated model curricula in physics becomes in tune with the changing scenario and incorporate new and rapid advancements and multi disciplinary skills, societal relevance, global interface, self sustaining and supportive learning.

It is desired that undergraduate i.e. B.Sc. level besides grasping the basic concepts of physics should in addition have broader vision. Therefore, they should be exposed to societal interface of physics and role of physics in the development of technologies.

EXAMINATION SCHEME:

1. There shall be 2 theory papers of 3 hours duration each and one practical paper of 4 hours duration. Each paper shall carry 50 marks.
2. Numerical problems of at least 30% will compulsorily be asked in each theory paper.
3. In practical paper, each student has to perform two experiments one from each groups as listed in the list of experiments.
4. Practical examination will be of 4 hours duration- one experiment to be completed in 2 hours.

   The distribution practical marks as follows:

Experiment	:	15+15=30
Viva voce	:	10
Internal assessment	:	10
5. The external examiner should ensure that at least 16 experiments are in working order at the time of examination and submit a certificate to this effect.

30/5/19 30/5/19 30/5/19

30/5/19 30/5/19

Session 2019-20

PHYSICS

B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

TEXT AND REFERENCE BOOKS:

1. E M Purcell, Ed Berkely physics course, vol. Mechanics (Mc. Gr. Hill) R P Feynman.
2. R B Lighton and M Sands, the Feynman lectures in physics, vol I (B) publications, Bombay, Delhi, Calcutta, Madras.
3. D P Khandelwal, Oscillations and waves (Himalaya Publishing House Bombay).
4. R. K. Ghosh, The Mathematics of waves and vibrations (Macmillan 1975).
5. J.C. Upadhyaya- Mechanics (Hindi and English Edition.)
6. D.S. Mathur- Mechanics and properties of matter.
7. Brijlal and Subramanium- Oscillations and waves. Resnick and Halliday- Volume I
8. Physics Part –1: Resnick and Halliday.

Session 2019-20

PHYSICS

Paper-II

ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.

Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

Biot-Savart's Law and its applications: B due to (1) a Straight Current Carrying Conductor and (2) Current Loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital law (Integral and Differential Forms).

Unit-5 Electromagnetic induction, Faraday's law, electromotive force, integral and differential forms of Faraday's law Mutual and self inductance, Transformers, energy in a static magnetic field. Maxwell's displacement current, Maxwell's equations, electromagnetic field energy density. The wave equation satisfied by E and B, plane electromagnetic waves in vacuum, Poynting's vector.

TEXT AND REFERENCE BOOKS:

1. Berkeley Physics Course, Electricity and Magnetism, Ed. E.M. Purcell (Mc Graw - Hill).
2. Halliday and Resnik, Physics, Vol. 2.
3. D J Grifith, Introduction to Electrodynamics (Prentice-Hall of India).
4. Raitz and Milford, Electricity and Magnetism (Addison-Wesley).
5. A S Mahajan and A A Rangwala, Electricity and Magnetism (Tata Mc Graw-hill).
6. A M Portis, Electromagnetic fields.
7. Pugh & Pugh, Principles of Electricity and Magnetism (Addison-Wesley).
8. Panofsky and Phillips, Classical Electricity and Magnetism, (India Book House).
9. S S Atwood, Electricity and Magnetism (Dover).

Session 2019-20

PHYSICS

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

TEXT AND REFERENCE BOOKs:

1. B saraf et al Mechanical Systems(Vikas publishing House,New Delhi).
2. D.P. khandelwal, A Laboratory Manual of Physics for Undergraduate classes (Vani Publication House,New Delhi).
3. C G Lambe Elements of statistics (Longmans Green and Co London New York, Tprpnto).
4. C Dixon, Numerical analysis.
5. S Lipsdutz and A Poe, schaum's outline of theory and problems of programming with Fortran (MC Graw-Hill Book Company, Singapore 1986).

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
NEW CURRICULUM OF B.Sc. PART I
Session 2019-20
CHEMISTRY

The new curriculam will comprise of three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curriculam is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I
INORGANIC CHEMISTRY

60Hrs. M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation energy and solubility of ionic solids, polarising power & polarisabilitry of ions, Fajans rule, Ionic character in covalent compounds: Bond moment and dipole moment, Percentage ionic character from dipole moment and electronegatiity difference, Metallic bond-free electron, Valence bond & band theories.

UNIT-III

CHEMICALBONDING II

Covalent bond: Lewis structure, Valence bond theory and its limitations, Concept of hybridization, Energetics of hybridization, equivalent and non-equivalent hybrid orbitals. Valence shell electron pair repulsion theory (VSEPR), shapes of the following simple molecules and ions containing lone pairs and bond pairs of electrons: H_2O, NH_3, PCl_3, PCl_5, SF_6. H_3O^+, SF_4, ClF_3, and ICl_2^- Molecular orbital theory. Bond order and bond strength, Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2, O_2, F_2, CO, NO.

UNIT-IV

A. s-BLOCK ELEMENTS

General concepts on group relationships and gradation properties, Comparative study, salient features of hydrides, solvation & complexation tendencies including their function in biosystems and introduction to alkyl & aryls, Derivatives of alkali and alkaline earth metals

B. p-BLOCK ELEMENTS

General concepts on group relationships and gradation properties. Halides, hydrides, oxides and oxyacids of Boron, Aluminum, Nitrogen and Phosphorus. Boranes, borazines, fullerenes, graphene and silicates, interhalogens and pseudohalogens.

UNIT-V

A CHEMISTRY OF NOBLE GASES

Chemical properties of the noble gases, chemistry of xenon, structure, bonding in xenon compounds

B. THEORETICAL PRINCIPLES IN QUALITATIVE ANALYSIS (H_2S SCHEME)

Basic principles involved in the analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II.

REFERENCE BOOKS:

1. Lee, J. D. Concise Inorganic Chemistry ELBS, 1991.
2. Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry Oxford, 1970
3. Atkins, P.W. & Paula, J. Physical Chemistry, 10th Ed., Oxford University Press, 2014.
4. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications, 1962.
5. Rodger, G.E. Inorganic and Solid State Chemistry, Cengage Learning India Edition, 2002.
6. Puri, B. R., Sharma, L. R. and Kalia, K. C., Principles of Inorganic Chemistry, Milestone Publishers/ Vishal Publishing Co.; 33rd Edition 2016
7. Madan, R. D. Modern Inorganic Chemistry, S Chand Publishing, 1987.

PAPER: II

ORGANIC CHEMISTRY

UNIT-I BASICS OF ORGANIC CHEMISTRY

Hybridization, Shapes of molecules, Influence of hybridization on bond properties. Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment. Electrophiles and Nucleophiles; Nucleophilicity and basicity; Homolytic and Heterolytic cleavage, Generation, shape and relative stability of Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes. Introduction to types of organic reactions: Addition, Elimination and Substitution reactions.

UNIT-II INTRODUCTION TO STEREOCHEMISTRY

Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with two or more chiral-centres, Diastereoisomers, meso compounds, Relative and absolute configuration: Fischer, Newmann and Sawhorse Projection formulae and their interconversions; Erythrose and threose, D/L, d/l system of nomenclature, Cahn-Ingold-Prelog system of nomenclature (C.I.P rules), R/S nomenclature. Geometrical isomerism: cis–trans, syn-anti and E/Z notations.

UNIT-III CONFORMATIONAL ANALYSIS OF ALKANES

Conformational analysis of alkanes, ethane, butane, cyclohexane and sugars. Relative stability and Energy diagrams. Types of cycloalkanes and their relative stability, Baeyer strain theory: Theory of strainless rings, Chair, Boat and Twist boat conformation of cyclohexane with energy diagrams; Relative stability of mono-substituted cycloalkanes and disubstituted cyclohexane.

UNIT-IV CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon sigma (σ) bonds

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reaction, Free radical substitutions: Halogenation-relative reactivity and selectivity.

B. Carbon-Carbon Pi (л) bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations.

Reactions of alkenes: Electrophilic additions and mechanisms (Markownikoff/Anti -Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1,2-and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene.

Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

UNIT-V AROMATIC HYDROCARBONS

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/ carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directive effects of the groups.

REFERENCE BOOKS:

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
4. Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994.
5. Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.
6. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
7. Organic Chemistry, Paula Y. Bruice, 2nd Edition, Prentice-Hall, International Edition (1998).
8. A Guide Book of Reaction Mechanism by Peter Sykes.

PAPER - III
PHYSICAL CHEMISTRY

M.M.34

UNIT-I
MATHEMATICAL CONCEPTS FOR CHEMIST

Basic Mathematical Concepts: Logarithmic relations, curve sketching, linear graphs, Properties of straight line, slope and intercept, Functions, Differentiation of functions, maxima and minima; integrals; ordinary differential equations; vectors and matrices; determinants; Permutation and combination and probability theory, Significant figures and their applications.

UNIT-II
GASEOUS STATE CHEMISTRY

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path; Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Joule Thomson effect, Liquification of Gases.

Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor (Z), and its variation with pressure and temperature for different gases. Causes of deviation from ideal behaviour. van der Waals equation of state, its derivation and application in explaining real gas behaviour, calculation of Boyle temperature. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states.

UNIT-III

A. LIQUID STATE CHEMISTRY

Intermolecular forces, magnitude of intermolecular force, structure of liquids, Properties of liquids, viscosity and surface tension.

B. COLLOIDS and SURFACE CHEMISTRY

Classification, Optical, Kinetic and Electrical Properties of colloids, Coagulation, Hardy Schulze law, flocculation value, Protection, Gold number, Emulsion, micelles and types, Gel, Syneresis and thixotrophy, Application of colloids.

Physical adsorption, chemisorption, adsorption isotherms (Langmuir and Freundlich). Nature of adsorbed state. Qualitative discussion of BET.

UNIT-IV

SOLID STATE CHEMISTRY

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, qualitative idea of point and space groups, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Crystal defects.

UNIT-V

A. CHEMICAL KINETICS

Rate of reaction, Factors influencing rate of reaction, rate law, rate constant, Order and molecularity of reactions, rate determining step, Zero, First and Second order reactions, Rate and Rate Law, methods of determining order of reaction, Chain reactions.

Temperature dependence of reaction rate, Arrhenius theory, Physical significance of Activation energy, collision theory, demerits of collision theory, non mathematical concept of transition state theory.

B. CATALYSIS

Homogeneous and Heterogeneous Catalysis, types of catalyst, characteristic of catalyst, Enzyme catatysed reactions, Micellar catatysed reactions, Industrial applications of Catalysis.

REFERENCE BOOKS:

1. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 10th Ed., Oxford University Press (2014).
2. Ball, D. W. Physical Chemistry Thomson Press, India (2007).
3. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
4. Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
5. Engel, T. & Reid, P. Physical Chemistry 3rd Ed. Pearson (2013).
6. Puri, B.R., Sharma, L. R. and Pathania, M.S., Principles of Physical Chemistry, Vishal Publishing Co., 47th Ed. (2016).
7. Bahl, A., Bahl, B.S. and Tuli, G.D. Essentials of Physical Chemistry, S Chand Publishers (2010).
8. Rakshit P.C., Physical Chemistry, Sarat Book House Ed. (2014).
9. Singh B., Mathematics for Chemist, Pragati Publications.

PAPER - IV
LABOBATORY COURSE

INORGANIC CHEMISTRY

A. Semi-micro qualitative analysis (using H_2S or other methods) of mixtures - not more than four ionic species (two anions and two cations, excluding interfering, insoluble salts) out of the following:
Cations : NH_4^+, Pb^{2+}, Bi^{3+}, Cu^{2+}, Cd^{2+}, Fe^{3+}, Al^{3+}, Co^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Na^+
Anions : CO_3^{2-} , S^{2-}, SO_3^{2-}, $S_2O_3^{2-}$, NO_2^-, CH_3COO^-, Cl^-, Br^-, I^-, NO_3^-, SO_4^{2-}
(Spot tests may be carried out wherever feasible)

B. Acid-Base Titrations

- Standardization of sodium hydroxide by oxalic acid solution.
- Determination of strength of HCl solution using sodium hydroxide as intermediate.
- Estimation of carbonate and hydroxide present together in mixture.
- Estimation of carbonate and bicarbonate present together in a mixture.
- Estimation of free alkali present in different soaps/detergents

C. Redox Titrations

- Standardization of $KMnO_4$ by oxalic acid solution.
- Estimation of Fe(II) using standardized $KMnO_4$ solution.
- Estimation of oxalic acid and sodium oxalate in a given mixture.
- Estimation of Fe(II) with $K_2Cr_2O_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

D. Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution iodimetrically.
- Estimation of (a) arsenite and (b) antimony iodimetrically.
- Estimation of available chlorine in bleaching powder iodometrically.
- Estimation of Copper and Iron in mixture by standard solution of $K_2Cr_2O_7$ using sodium thiosulphate solution as titrants.

ORGANIC CHEMISTRY

1. Demonstration of laboratory Glasswares and Equipments.
2. Calibration of the thermometer. 80°–82° (Naphthalene), 113.5^o–114° (Acetanilide), 132.5^o-133° (Urea), 100° (Distilled Water).)

3. Purification of organic compounds by crystallization using different solvents.
   - Phthalic acid from hot water (using fluted filter paper and stemless funnel).
   - Acetanilide from boiling water.
   - Naphthalene from ethanol.
   - Benzoic acid from water.

4. Determination of the melting points of organic compounds.

   Naphthalene 80°–82°, Benzoic acid 121.5°–122°, Urea 132.5°–133° Succinic acid 184.5°–185°, Cinnamic acid 132.5°–133°, Salicylic acid 157.5°–158°, Acetanilide 113.5°–114°, m-Dinitrobenzene 90°, p-Dichlorobenzene 52°, Aspirin 135°.

5. Effect of impurities on the melting point – mixed melting point of two unknown organic compounds.
   - Urea – Cinnamic acid mixture of various compositions (1:4, 1:1, 4:1).

6. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100 °C by distillation and capillary method).
   - Ethanol 78°, Cyclohexane 81.4°, Toluene 110.6°, Benzene 80°.

i. Distillation (Demonstration)
   - Simple distillation of ethanol-water mixture using water condenser.
   - Distillation of nitrobenzene and aniline using air condenser.

ii. Sublimation
   - Camphor, Naphthalene, Phthalic acid and Succinic acid.

iii. Decolorisation and crystallization using charcoal.
   - Decolorisation of brown sugar with animal charcoal using gravity filtrations crystallization and decolorisation of impure naphthalene (100 g of naphthalene mixed with 0.3 g of Congo red using 1 g of decolorizing carbon) from ethanol.

7. Qualitative Analysis

   Detection of elements (N, S and halogens) and functional groups (Phenolic, Carboxylic, CarbonyI, Esters, Carbohydrates, Amines, Amides, Nitro and Anilide) in simple organic compounds.

PHYSICAL CHEMISTRY

1. Surface tension measurements.
   - Determine the surface tension by (i) drop number (ii) drop weight method.
   - Surface tension composition curve for a binary liquid mixture.

2. Viscosity measurement using Ostwald's viscometer.
   - Determination of viscosity of aqueous solutions of (i) sugar (ii) ethanol at room temperature.

- Study of the variation of viscosity of sucrose solution with the concentration of solute.
- Viscosity Composition curve for a binary liquid mixture.

3. Chemical Kinetics
    - To determine the specific rate of hydrolysis of methyl/ethyl acetate catalysed by hydrogen ions at room temperature.
    - To study the effect of acid strength on the hydrolysis of an ester.
    - To compare the strengths of HCl & H_2SO_4 by studying the kinetics of hydrolysis of ethyl acetate.
4. Colloids
    - To prepare colloidal solution of silver nanoparticles (reduction method) and other metal nanoparticles using capping agents.

Note: Experiments may be added/ deleted subject to availability of time and facilities

PRACTICAL EXAMINATION

05 Hrs. M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry) **12 marks**
2. Detection of functional group in the given organic compound and determine its MPt/BPt. **8 marks**

   O R

   Crystallization of any one compound as given in the prospectus along with the Determination of mixed MPt.

   O R

   Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.
3. Any one physical experiment that can be completed in two hours including calculations. **14 marks**
4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

Hemchand Yadav Vishwavidyala, Durg (C.G.)

Zoology

B.Sc. Part I (2019-20)

Paper I

(Cell Biology and Non-chordata)

Unit:I

1. The cell (Prokaryotic and Eukaryotic)
2. Organization of Cell: Extra-nuclear and nuclear
   Plasma membrane, Mitochondria, Endoplasmic reticulum, Golgi body, Ribosome and Lysosome).
3. Nucleus, Chromosomes, DNA and RNA

Unit:II

1. Cell division (Mitosis and Meiosis).
2. An elementary idea of Cancer cells And Cell transformation.
3. An elementary idea of Immunity: Innate & Acquired Immunity, Lymphoid organs, Cells of Immune System, Antigen, antibody and their interactions

Unit:III

- General characters and classification of Phylum Protozoa, Porifera, and Coelenterata up to order.

2. Protozoa: Type study - Paramecium,
2. Porifera: Type study - Sycon.
3. Coelenterata: Type study - Obelia

.

Unit: IV

- General characters and classification of Phylum Platyhelminthes, Nemathelminthes, Annelida and Arthropoda up to order.

2. Platyhelminthes and Nemathelminthes: Type Study – Fasciola, Ascaris
3. Annelida: Type Study - Pheretima.
4. Arthropoda: Type Study - Palaemone.

Unit:V

- General characters and classification of Phylum Mollusca and Echinodermata up to order.

2. Mollusca: Type Study - Pila.
3. Echinodermata- Type Study- Asterias (Starfish).

14.6.19

14.06.19

14.6.19.

Zoology
B.Sc. Part I (2019-20)
Paper II
(Chordata and Embryology)

Unit:I

1. Classification of Hemichordata
2. Hemichordata- Type study-Balanoglossus
3. Classification of Chordates upto orders..
4. Protochordata-Type study - Amphioxus.
5. A comparative account of Petromyzon and Myxine.

Unit-II

1. Fishes-Skin & Scales, migration in fishes, Parental care in fish.
2. Amphibia-Parental care and Neoteny.
3. Reptilia- Poisonous & Non-poisonous Snakes, Poison apparatus, snake venom and Extinct Reptiles

Unit-:III

1. Birds- Flight Adaptation, Migration, and Perching mechanism, Discuss-Birds are glorified reptiles.
2. Mammals-Comparative account of Prototheria, Metatheria, Eutheria and Affinities.
3. Aquatic Mammals and their adaptations.

Unit:IV

1. **Fertilization**
2. Gametogenesis, Structure of gamete and Typesof eggs
3. Cleavage
4. Development of Frog up to formation of three germ layers.
5. Parthenogenesis

Unit:V

1. Embryonic induction, Differentiation and Regeneration.
2. Development of Chick (a) up to formation of three germ layers, (2) Extra-embryonic membranes.
3. Placenta in mammals.

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Zoology
B.Sc. Part I (2019-20)
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

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B.Sc.– I (BOTANY) PAPER-I

BACTERIA, VIRUSES, FUNGI, LICHENS AND ALGAE

UNIT-I

VIRUSES: General characteristics, types of viruses based on structure and genetic material. Multiplication of viruses (General account), Lytic and Lysogenic cycle. Economic importance. Structure and multiplication of Bacteriophages. General account of Viroids, Virusoids, Prions, and Cyanophages. Mycorrhiza-Types and Significance.

UNIT –II

BACTERIA: General characteristics and classification (on the basis of morphology), fine structure of bacterial cell, Gram positive and Gram negative bacteria, mode of nutrition and reproduction vegetative, asexual and recombination (Conjugation, transformation and transduction), Economic importance. Microbial Biotechnology, *Rhizobium, Azatobactor, Anabena.*

UNIT-III

FUNGI: General account of habit and habitat, structure (range of thallus organization), cell wall composition, nutrition and reproduction in fungi. Heterothallism and Parasexuality. Outlines of classification of fungi. Economic importance of fungi. Life cycles of *Saprolegnia, Albugo,, Aspergillus, Peziza, Agaricus, Ustilago, Puccinia, Alternaria and Cercospora.* VAM Fungi

UNIT-IV

ALGAE: Algae: General characters, range of thallus organization, Gaidukov phenomenon, reproduction, life cycle patterns and economic importance.Classification, Systematic position, occurrence, structure and life cycle of following genera : *Nostoc, Gloeocaspsa, Volvox,, Oedogonium, Vaucheria, Chara, Ectocarpus, Polysiphonia.*

UNIT –V

Lichens- General account, types, structure, nutrition, reproduction and economic importance. Mycoplasma: Structure and importance. Blue Green Algae (BGA) in nitrogen economy of soil and reclamation of Ushar land.Mushroom Biotechnology

Books Recommended:

Dubey R.C. and Maheshwari D.K. ***A text book of Microbiology,*** S. Chand Publishing, New Delhi

Presscott, L. Harley, J.and Klein, D. ***Microbiology***, 7th edition, Tata Mc Graw-Hill Co.New Delhi.

Sharma P.D., ***Microbiology and Plant pathology,*** Rastogi Publication. New Delhi.

13.6.19 13.6.19 13/6/19 13.6.19

Alexopolous, C.J. Mims, C.W. and Blackwell, MM. ***Introduction to Mycology,*** John Wiley & Sons.

Dubey H.C. ***An Introduction to Fungi,*** Vikas Publishing, New Delhi

Mehrotra R.S. & Agrawal A., ***Plant Pathology,*** Tata McGraw, New Delhi

Sharma P.D. ***Plant Pathology***, Rastogi Publishers, Meruth.

Sristava, H.N. ***Fungi***, Pradeep Publications, Jalandhar

Webster, J. & Weber, R. ***Introduction to Fungi***, Cambridge University Press, Cambridge

Kumar H.D. ***Introduction to phycology***, Aff. East-west Press, New Delhi

Lee RE, ***Phycology***, Cambridge University Press U.K.

Srivastava, H.N., ***Algae***, Pradeep Publications, Jalandhar

Pandey S.K. Quick ***Concept of Botany***, Lambert Academic publishing, Germany

Pandey S.N., Mishra S,P. & Trivedi P.S. ***A Text Book of Botany*** (Vol.-I), Vikas Publishing, New Delhi

Singh, Pandey and Jain, ***A Text book of Botany,*** Rastogi Publication, Meerut.

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

B.Sc.-I (BOTANY) PAPER –II

(BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY)

UNIT –I

BRYOPHYTA: General characteristics, affinities, range of thallus organization, general classification and economic & ecological importance, Systematic position, occurrence, morphology anatomy and reproductive structure in *Riccia, Marchantia, Pellia, Anthoceros, Funaria.* Vegetative reproduction in Bryophytes, Evolution of sporophytes.

UNIT-II

PTERIDOPHYTES: General characteristics, affinities, economic importance and classification, Heterospory and seed habit, stellar system in Pteridophytes, Aposory and apogamy, Telome theory, *Azolla* as Biofertilizer.

UNIT-III

Systematic position, occurrence. Morphology, anatomy and reproductive structure of *Psilotum, Lycopodium, selaginella, Equisetum, Marsilea.*

UNIT-IV

Gymnosperm: General characteristics, affinities, economic importance and classification, Morphology, anatomy and reproduction in *Cycas, Pinus* and *Ephedra.*

UNIT-V

PALAEOBOTANY: Geological time scale, types of fossils and fossilization, Rhynia, study of some fossil gymnosperms. *Lygenopteris*

Books Recommended:

Parihar, N.S. ***The Biology and Morphology of Pteridophytes,*** Central Book Depot, Allahabad.

Parihar,N.S. ***An introduction to Bryophyta Vol.I:Bryophytes*** Central Book Depot, Allahabad.

Sambamurty,AVSS, ***A textbook of Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany***, IK International Publishers.

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Pandey SN, Mishra SP and Trivedi PS ***A text Book of Botany (Vol.II)***, Vikas Publishing, New Delhi

Bhatanagar, SP and Moitra, A. ***Gymnosperm***, New Age International (P) Ltd., Publishers, New Delhi

Biswas C. and Johri BM, ***The Gymnosperms***, Springer-Verlag, Germany.

Srivastava, HN, ***Palaeobotany***, Pradeep Publications Jalandhar

Srivastava, HN, Bryophyta, Pradeep Publications Jalandhar

Singh, Pandey and Jain, ***A Text Book of Botany***, Rastogi Publication, Meerut

Sristava, HN, ***Fundamentals of Pteridophytes,*** Pradeep Publications, Jalandhar

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B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

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MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.Sc. Part-I
MATHEMATICS
PAPER - I
ALGEBRA AND TRIGONOMETRY

UNIT-I Elementary operations on matrices, Inverse of a matrix. Linear independence of row and column matrices, Row rank, column rank and rank of a matrix. Equivalence of column and row ranks. Eigenvalues, eigenvectors and the characteristic equations of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

UNIT-II Application of matrices to a system of linear (both homogeneous and nonhomogeneous) equations. Theorems on consistency of a system of linear equations. Relation between the roots and coefficients of general polynomial equations in one variable. Transformation of equations. Descarte's rule of signs. Solutions of cubic equations (Cardons method), Biquadratic equation.

UNIT-III Mappings, Equivalence relations and partitions. Congruence modulo n. Definition of a group with examples and simple properties. Subgroups, generation of groups, cyclic groups, coset decomposition, Lagrange's theorem and its consequences. Fermat's and Euler's theorems. Normal subgroups. Quotient group, Permutation groups. Even and odd permutations. The alternating groups An. Cayley's theorem.

UNIT-IV Homomorphism and Isomorphism of groups. The fundamental theorems of homomorphism. Introduction, properties and examples of rings, Subrings, Integral domain and fields Characteristic of a ring and Field.

TRIGONOMETRY :

UNIT-V De-Moivre's theorem and its applications. Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantity. Expansion of trigonometrical functions. Gregory's series. Summation of series.

TEXT BOOK :

1. I.N. Herstein, Topies in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd.New Delhi, 2000.
3. Chandrika Prasad, Text-Book on Algebra and Theory of equations, Pothishala Private Ltd., Allahabad.
4. S.L. Loney, Plane Trigonometry Part II, Macmillan and Company, London.

REFERENCES :

1. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, First Course in linear Algebra, Wiley Eastern, New Delhi, 1983.
2. P.B. Bhattacharya, S.K.Jain and S.R. Nagpaul, Basic Abstract Algebra (2 edition), Cambridge University Press, Indian Edition, 1997.
3. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic linear Algebra with MATLAB, Key College Publishing (Springer-Verlag), 2001.
4. H.S. Hall and S.R. Knight, Higher Algebra, H.M. Publications, 1994.
5. R.S. Verma and K.S. Shukla, Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.

B.Sc. Part-I

MATHEMATICS

PAPER - II

CALCULUS

DIFFERENTIAL CALCULUS :

UNIT-I $\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuties. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

UNIT-II Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in cartesian and polar coordinates.

INTEGRAL CALCULUS:

UNIT-III Integration of transcendental functions. Reduction formulae. Definite integrals. Quadrature. Rectification. Volumes and surfaces of solids of revolution.

ORDINARY DIFFERENTIAL EQUATIONS :

UNIT-IV Degree and order of a differential equation. Equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

UNIT-V Linear differential equations of second order. Transformation of the equation by changing the dependent variable/the independent variable. Method of variation of parameters. Ordinary simultaneous differential equations.

TEXT BOOK :

1. Gorakh Prasad, Differential Calculaus, Pothishala Private Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad.
3. D.A. Murray Introductory Course in Differential Equations, Orient Longman (India), 1976.

REFERENCES :

1. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's outline series, Schaum Publishing Co. New York.
3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
4. P.K. Jain and S.K. Kaushik, An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
5. G.F. Simmons, Differential Equations, Tata Mc Graw Hill, 1972.
6. E.A. Codington, An Introduction to Ordinary Differential Equations, Prentics Hall of India, 1961.
7. H.T.H. Piaggio, Elementary Treatise on Differential Equations and their Applications, C.B.S. Publishe & Distributors, Dehli, 1985.
8. W.E. Boyce and P.O. Diprima, Elementary Differential Equations and Boundary Value Problems, John Wiley, 1986.

12. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley and Sons, 1999.

B.Sc. Part-I

MATHEMATICS

PAPER - III

VECTOR ANALYSIS AND GEOMETRY

VECTOR ANALYSIS :

UNIT-I Scalar and vector product of three vectors. Product of four vectors. Reciprocal Vectors. Vector differentiation. Gradient, divergence and curl.

UNIT-II Vector integration. Theorems of Gauss, Green, Stokes and problems based on these.

UNIT-III General equation of second degree. Tracing of conics. System of conics. Confocal conics. Polar equation of a conic.

UNIT-IV Sphere. Cone. Cylinder.

UNIT-V Central Conicoids. Paraboloids. Plane sections of conicoids. Generating lines. Confocal Conicoids. Reduction of second degree equations.

TEXT BOOKS :

1. N. Saran and S.N. Nigam, Introduction to vector Analysis, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry, Pothishala Pvt. Ltd., Allahabad.
3. R.J.T. Bell, Elementary Treatise on Coordinate Geometry of three dimensions, Machmillan India Ltd. 1994.

REFERENCES :

1. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2. Murray R. Spiegel, Vector Analysis, Schaum Publishing Company, New York.
3. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, 1999.
4. Shanti Narayan, A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
5. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, london.
6. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd., 1994.
7. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of three Dimensions, Wiley Eastern Ltd., 1999.
8. N. Saran and R.S. Gupta, Analytical Geometry of three Dimensions, Pothishala Pvt. Ltd. Allahabad.

MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Oscillatoria

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. GeneralMicrobiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Paper- II: Biochemistry and Physiology

UNIT-1: CARBOHYDRATES AND PROTEINS

Structure, classification and properties of Carbohydrates – Monosaccharide, Oligosaccharides (Disaccharides) and Polysaccharides. Structure, classification and properties of Protein - Amino acids, peptides and Proteins (Primary, Secondary, Tertiary and Quaternary structure).

UNIT-2: LIPIDS AND NUCLEIC ACIDS

Structure, classification and properties of Lipids; Saturated and Unsaturated fatty acids. Structure and properties of Nucleotides. Structure and forms of DNA; Replication of DNA. Types, Structure and Function of RNA.

UNIT-3: ENZYMES

Structure, Nomenclature, Classification and Properties of Enzymes. Mechanism of enzyme action, Enzyme kinetic: Michaelis-Menten. Equation & derivation, Enzyme inhibition, Lineweaver-Burk Plot (LB plot). Co-enzymes and their role; Allosteric enzymes and Isoenzyme. Extracellular enzymes and their role.

UNIT-4: MICROBIAL METABOLISM

Bacterial photosynthesis and Chemosynthesis: Glycolysis, TCA cycle and Oxidative Phosphorylation. Anaerobic catabolism of glucose; Fat Biosynthesis,alpha and beta oxidation of fatty acids. Deamination, trasns-amination and Urea cycle.

UNIT-5: GROWTH PHYSIOLOGY & TRANSPORT SYSTEM

Bacterial cell division, Genome replication and Growth Phases, Conditions for growth. Plasma membrane & Transport system, types of transport (Passive and active). Diffusion (simple & facilitated), Concept of Uniport, Antiport and Symport;

Text Books Recommended:

1. General Biochemistry by A.C. Deb.
2. Biochemistry by Lehninger (Kalyani publication)
3. Biochemistry by U. Satyanarayan.
4. Microbiology by Anantanarayan and Panikar.
5. Fundamentals of Biochemistry; J L Jain, Sunjay Jain, Nitin Jain; S. Chand & Company Ltd
6. Practical Biochemistry: Principles and Techniques; *5th Edition*; Keith Wilson and John Walker
7. Biophysical Biochemistry: Principles and Techniques; AvinashUpadhyay, KakoliUpadhyay and Nirmalendu Nath; Himalaya Publishing House.

15/6/19 15/6/19 15/6/19 15/06/19

PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
Total	50

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

B.Sc. Part-01 Geology

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

22-5-19 22/5/19

कक्षा / Class - B. Sc. – I
Session 2019-20
Paper –I
भूगतिकी एवं भूआकृति विज्ञान
(Geodynamics & Geomorphology)

इकाई– 01 (i) भूविज्ञान एवं परिप्रेक्ष्य; सौरमण्डल में सूर्य की स्थिति ; परिमाण, आकार, संहति, घनत्व।

(ii) पृथ्वी की उत्पत्ति

(iii) पृथ्वी की आंतरिक संरचना, भूपर्पटी, प्रवार एवं क्रोड

(iv) पृथ्वी की आयुः निर्धारण की विधियाँ, रेडियोधर्मी विधि

(v) वायुमण्डल, जलमण्डल एवं जैवमण्डल का निर्माण एवं संगठन

इकाई– 02 (i) प्लेटविवर्तनिकी का प्रारंभिक अध्ययन

(ii) महाद्वीपीय विस्थापन की अवधारणायें एवं सिद्धान्त

(iii) समस्थैतिकी की अवधारणायें एवं सिद्धान्त

(iv) समुद्रतल विस्तारण का साक्ष्य

(v) समुद्र, महाद्वीप एवं पर्वतों की उत्पत्ति

इकाई– 03 (i) भूकम्पः भूकम्प की पट्टियाँ, भूकम्प की तीव्रता

(ii) ज्वालामुखीः प्रकार एवं वितरण

(iii) अंतः समुद्रीपर्वतों, चापाकार द्वीपमालाओं एवं खाइयों का उद्भव, वितरण एवं महत्व

(iv) महाद्वीपीय तटीय क्षेत्रों की विवर्तनिकी : सक्रिय तट एवं सीमांतीय द्रोणियाँ

(v) नवविवर्तनिकी : सक्रियभ्रंश, अपवाह परिवर्तन

इकाई– 04 (i) भूआकृति विज्ञान की मूलभूत धारणायें

(ii) भूआकृतिक कारक एवं शैल अपक्षय की प्रक्रियायें,

(iii) नदी के भूवैज्ञानिक कार्य एवं नदीय भूआकृतियाँ

(iv) वायु के भूवैज्ञानिक कार्य एवं वायुजनित भूआकृतियाँ

(v) हिमनदों के भूवैज्ञानिक कार्य एवं हिमनदजनित भूआकृतियाँ

इकाई– 05 (i) समुद्र के भूवैज्ञानिक कार्य एवं तटीय भूआकृतियाँ
(ii) भूमिगत जल के भूवैज्ञानिक कार्य एवं कार्स्टस्थलाकृति
(iii) ज्वालामुखीय भूआकृतियाँ
(iv) पृथ्वी का उष्मा बजट एवं वैश्विक जलवायु परिवर्तन
(v) भारत का भूआकृतिक विभाजन

27-5-19 27/5/19

प्रायोगिक कार्य –

(1) भूआकृतिक संरचनाओं को प्रदर्शित करने वाले प्रादर्शों का अध्ययन

(2) स्थलाकृतिक मानचित्रों का अध्ययन एवं विभिन्न पैमानों पर सूचक–निर्धारण की जानकारियॉ

(3) भूआकृतिक–मानचित्रों में विभिन्न भूआकृतियों एवं प्रवाह प्रणालियों का अध्ययन

(4) भारत के रेखित–मानचित्र में मुख्य पर्वतों, झीलों एवं नदियों को अंकित करना

(5) भारत के रेखित मानचित्र में भूकम्प प्रेक्षणालयों को अंकित करना

(6) भारतीय महाद्वीपों में आये भूकम्पों के अधिकेन्द्र एवं तीव्रता को मानचित्र में अंकित करना।

(7) आकारमितिक विश्लेषण

Suggested Readings:-

भौतिक–भूविज्ञान	–	डॉ. मुकुल घोष–
भौतिक–भूविज्ञान	–	जे.पी. तिवारी एव ंबी.के. सिंह–
भूआकृति–विज्ञान	–	डॉ. सविन्द्र सिंह
भूविज्ञान एक परिचय	–	डॉ. विद्यासागर दुबे
Physical Geology	-	Miller
Principles of physical geology	-	A. Holmes
An introduction to physical geology-		A.K. Dutta
Principles of Geomorphology	-	W.D. Thornbury
Principles of Geomorphology	-	A.F. Ahmed

Class- B. Sc. - I
Paper –I
(Geodynamics & Geomorphology)

Unit:1	(i)	Geology & it perspectives. Earth in the solar system; size, shape, mass & density.
	(ii)	Origin of Earth.
	(iii)	Internal structure of Earth, Crust, Mantle and Core.
	(iv)	Age of Earth: with special emphasis on Radioactive dating.
	(v)	Formation & composition of Hydrosphere, Biosphere & Atmosphere.
Unit:2	(i)	Elementary idea about Plate-Tectonics.
	(ii)	Concept & theories of continental-drift
	(iii)	Concept & theories of Isostasy.
	(iv)	Evidences of Sea-floor spreading.
	(v)	Origin of oceans, continents & mountains.
Unit:3	(i)	Earthquakes, Earthquake Belts, measurement of Earthquakes.
	(ii)	Volcanoes: Types & distribution.
	(iii)	Mid –oceanic- ridges, trenches & island arc; origin, distribution & importance.
	(iv)	Tectonics of continental margins; Active margins & marginal basins.
	(v)	Neo-tectonics; active faults, drainage changes.
Unit:4	(i)	Fundamental concepts of Geomorphology.
	(ii)	Geomorphic agents & processes of rock-weathering.
	(iii)	Geological work of rivers; fluvial landforms.
	(iv)	Geological work of wind; Aeolian landforms.
	(v)	Geological work of Glaciers; glacial landforms.
Unit:5	(i)	Geological work of oceans; coastal landforms.
	(ii)	Geological work of Ground water. Karst topography.
	(iii)	Volcanic landforms.
	(iv)	Earth's heat budget & global climatic changes.
	(vi)	Physiographic divisions of India.

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PRACTICALS:

(1) Study of models showing various Geomorphic features.

(2) Numbering, Indexing of topographic maps on various scales.

(3) Interpretation of various Geomorphic landforms & drainage pattern on topographic maps.

(4) Plotting of major mountain Ranges, Lakes & rivers on outline map of India.

(5) Plotting of seismic observatories on outline map of India.

(6) Plotting of epicenters & magnitude of major earthquakes of Indian subcontinent.

(7) Morphometric analysis.

Suggested Readings:-

भौतिक–भूविज्ञान	–	डॉ. मुकुल घोष–
भौतिक–भूविज्ञान	–	जे.पी. तिवारी एव ंबी.के. सिंह
भूआकृति–विज्ञान	–	डॉ. सविन्द्र सिंह
भूविज्ञान एक परिचय	–	डॉ. विद्यासागर दुबे
Physical Geology	-	Miller
Principles of physical geology	-	A. Holmes
An introduction to physical geology-		A.K. Dutta
Principles of Geomorphology	-	W.D. Thornbury
Principles of Geomorphology	-	A.F. Ahmed

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कक्षा / Class- B.Sc-I

Paper –II

खनिज एवं क्रिस्टल विज्ञान

(Mineralogy & Crystallography)

इकाई– 01

(i) खनिज एवं क्रिस्टल की परिभाषा।

(ii) क्रिस्टल संरचना एवं यूनिट सेल।

(iii) क्रिस्टल के तत्व, क्रिस्टल रूप।

(iv) क्रिस्टलीय अक्ष एवं अक्षीय कोण।

(v) क्रिस्टल नोटेशन, अन्तःखण्डीय अनुपात एवं सूचकांक

इकाई– 02

(i) क्रिस्टल विज्ञान के नियम।

(ii) क्रिस्टलीय सममिति।

(iii) क्रिस्टलों का वर्गीकरण। क्रिस्टल समुदायों के सामान्यवर्ग की सममिति।

(iv) सामान्य वर्ग के रूप।

(v) क्रिस्टलों में यमलन।

इकाई– 03

(i) प्रकाश की प्रकृति, प्रकाश का परावर्तन एवं अपवर्तन।

(ii) अपवर्तनांक, क्रांतिक कोण, पूर्ण आंतरिक परावर्तन एवं बेके प्रभाव।

(iii) द्वि–अपवर्तन, निकॉल प्रिज्म की रचना एवं कार्य प्रणाली।

(iv) ध्रुवण सूक्ष्मदर्शी : अवयव एवं कार्यप्रणाली।

(v) खनिजों के प्रकाशीय गुण।

इकाई– 04

(i) सिलिकेट संरचनाएं

(ii) खनिजों में बंध।

(iii) समाकृतिकता, बहुरूपता एवं कूटरूपता।

(iv) ठोस–विलयन

(v) खनिजों के भौतिक गुण।

इकाई– 05 निम्नलिखित खनिज समूहों के संगठन, भौतिक एवं प्रकाशकीय गुणों का अध्ययन–

(i) ऑलिवीन्, गार्नेट एवं अभ्रक समूह।
(ii) पायरॉक्सीन।
(iii) एम्फीबोल।
(iv) फेल्सपार।
(v) सिलिका।

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प्रायोगिक कार्य–

(1) क्रिस्टल मॉडल में सममिति तत्वों का अध्ययन।

(2) सातों क्रिस्टल समुदायों की सामान्य वर्ग की मूल आकृतियों का अध्ययन।

(3) यूलर प्रमेय का सत्यापन।

(4) प्रमुख शैलकर खनिजों का स्थूलदर्शी अध्ययन।

(5) ध्रुवण–सूक्ष्मदर्शी की सहायता से प्रमुख शैलकर खनिजों के प्रकाशीय गुणों का अध्ययन।

(6) सात दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन

Class- B.Sc.-I
Paper –II
(Mineralogy & Crystallography)

Unit:1
(i) Definition of Mineral and Crystal.
(ii) Crystal structures, Unit cells
(iii) Elements of crystal. Crystal forms.
(iv) Crystallographic axes and axial angles.
(v) Parameters and indices of crystal notation

Unit:2
(i) Laws of Crystallography
(ii) Crystal symmetry
(iii) Classification and symmetry of normal classes of seven crystal systems
(iv) Forms of normal classes.
(v) Twinning in crystals

Unit:3
(i) Nature of light : reflection and refraction of light.
(ii) Refractive index. Critical angle. Total internal reflection and Becke effect.
(iii) Double refraction. Nicol prism, it's construction and working.
(iv) Polarizing Microscope- its parts & functions.
(v) Optical properties of minerals.

Unit:4
(i) Silicate structures.
(ii) Bonding in Minerals.
(iii) Isomorphism. Polymorphism and Pseudomorphism.
(iv) Solid solution
(v) Physical properties of minerals

Unit:5 Study of Composition, physical and optical properties of the following Mineral groups:
(i) Olivine, Garnet and Mica groups.
(ii) Pyroxenes
(iii) Amphiboles
(iv) Feldspars
(v) Silica

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PRACTICALS-

(1) Study of symmetry elements in crystal models.

(2) Study of fundamental forms of normal classes of all seven crystal systems.

(3) Verification of Euler's theorem.

(4) Study of physical properties of rock forming minerals.

(5) Study of the optical properties of important rock forming minerals using polarizing Microscope.

(6) Geological excursion for seven days.

Suggested Readings:

Rutley's elements of Mineralogy	:	Read, H.H.
Dana's text book of Mineralogy	:	Ford W.E.
खनिज तथा क्रिस्टल विज्ञान	–	डॉ. बी. सी. जैश
खनिज विज्ञान के सिद्धांत	–	डॉ. ए. पी. अग्रवाल
प्रायोगिक भू–विज्ञान (भाग–1)	–	डॉ. र. प्र. मांजरेकर
प्रकाशीय खनिज विज्ञान के मूल तत्व	–	विंचेल

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B.A./B.Sc. – First Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - First

Name of the Paper :- FOUNDATION OF ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Anthropology. History of Anthropology. Branches of Anthropology -

(a) Socio-cultural Anthropology
(b) Physical Biological Anthropology
(c) Archaeological Anthropology
(d) Linguistic Anthropology

UNIT – II Relationship of Anthropology with other disciplines: Life Sciences, Medical Sciences, Social Sciences: History, Economics, Sociology, Psychology, Political Science

UNIT – III Foundation in Biological Anthropology

(a) Human Evolution with respect to Hominid fossils
(b) Human Variation: Types and causes
(c) Human Genetics: Concept, scope and branches
(d) Human growth and development: Definition, scope, methods and factors effecting human growth and development

UNIT – IV Fundamentals in Social-Cultural Anthropology.

(a) Culture, Society, Community, Group, Institution
(b) Human Institution:-
Family: Definiton, types and function of family
Marriage: Definition, forms of marriage and its functions
Kinship: Definition, types and functions
Religion: Theories on the origin of religion
(c) Basic techniques of data collection :
Observation , Schedule, Questionnaire, Geneology

UNIT – V Fundamentals in Archaeological Anthropology.

(a) Tool typology & Technology: Paleolithic, Mesolithic & Neolithic
(b) Cultural evolution: Broad outlines of cultures (Stone age to metal age)
(c) Dating techniques in archaeology

20/06/19

B.A. /B.Sc. – First Year

Session: 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	PHYSICAL/ BIOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning, scope, History of Physical Anthropology & its applied aspects
Theories of organic evolution: Lamarckism, Neo-lamarckism, Darwinism, Neo-darwinism & Synthetic theory of evolution

UNIT – II Position of Man in animal kingdom, Classification of living primates, Comparative anatomy of Man and Apes (with special reference to skull, pelvis, dentition and long bones)

UNIT – III Fossil evidence of human evolution: Ramapithecus, Australopithecus, Pithecanthropus, Sinanthropus, Neanderthal, Cromagnon, Grimaldi man, Chancelade man.

UNIT – IV Concept of Race: Race formation and Criteria of racial classification, UNESCO Statement, Racial element in India, Major races of the world.

UNIT – V Human Genetics:

a. Structure of Chromosome, DNA & RNA

b. Mendelian principle.

c. Types of Inheritance in Human

20/06/19

B.A./B.Sc. – First Year

Session : 2018-19

Name of the Subject	:-	Anthropology
Paper	: -	Practical
Name of the Paper	:-	OSTEOLOGY AND CRANIOMETRY

Total Marks : 50 Pass Marks : 17

I. Identification of bones of human Skeleton. Sketching and labeling of various normas of skull, Overview of Pectoral & Pelvic girdles, Femur & Humerus bone

II. Craniometry :-
1. Maximum Cranial length.
2. Maximum Cranial Breadth.
3. Maximum frontal Breadth.
4. Bizygomatic Breadth.
5. Nasal Height.
6. Nasal Breadth
7. Minimum frontal breadth
8. Bimaxillary Breadth.
9. Maximum Biorbital Breadth
10. Length of magnum foramen.

III. Craniometric indices :
1. Cranial Index
2. Nasal Index

20/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A. /B.Sc. –I
Subject-Statistics
Paper – I (Paper Code-0803)
PROBABILITY THEORY

Unit-I
Important concepts in probability: Random experiment: trial, sample point and sample space, event, Operations of events, concepts of mutually exclusive and exhaustive events. Definition of probability: classical and relative frequency approach. Richard Von Misses, Cramer and Kolmogrove approachesto probability, merits and demerits to these approaches, any general idea to be given. Discrete probability space, Properties of probability based on axiomatic approaches, Independence of events, Conditional probability, total and compound probability rules, Baye's theorem and its applications.

Unit-II
Random variables: Definition of discrete random variable (rv); probability mass function (pmf) and cumulative distribution function (cdf). Joint pmf of several discrete rvs. Marginal and conditional pmfs. Independence of rvs. Idea of continuous random variables, probability density function, illustration of random variables and its properties. Expectation of a random variable and its properties -moments, measures of location and dispersion, skewness and kurtosis, Moment generating function, raw and central moments, Probability generating function (pgf) and, their properties and uses.

Unit-III
Standard univariate discrete distributions: degenerate, discrete uniform, hypergeometric, Poisson, geometric and negative binomial distributions. Marginal and conditional distributions, Distributions of functions of discrete rvs, reproductive property of standard distributions.

Unit-IV
Univariate continuous distributions and their properties: Uniform, Beta, Gamma, Exponential, Normal, Cauchy, Lognormal. Moment generating function (mgf) : its properties and applications.
Tchebycheff's inequality and applications, statements and applications of weak law of large numbers and central limit theorems.

Unit-V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.
2.Chung, K.L. (1979). Elementary Probability Theory with Stochastic Processes, Springer International Student Edition.
3. Edward P.J., Ford J.S. and Lin (1974): Probability for Statistical Decision-Marketing. Prentice Hall
4. Goon A.M., Gupta M.K. and Dasgupta B.(1999): Fundamentals of Statistics, Vol. I , World Press, Calcutta
5. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, Mc. Graw Hall.

ADDITIONAl REFERENCES:

6. Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.
7.David Stirzaker (1994). Elementary Probability, Cambridge University Press.
8.Feller, W. (1968). An Introduction to Probability Theory and its Applications, Wiley.
9. Hoel P.G. (1971): Introduction to Mathematical Statistics
10. Mayer P.L. (1970): Introductory Probability and Statistical Applications, Addition Wesley
11.Mukhopadhyay, P. (1996). Mathematical Statistics, New Central Book Agency, Calcutta.
12.Parzen, E. (1960). Modern Probability Theory and its Applications, Wiley Eastern.
13Pitman, Jim (1993). Probability, Narosa Publishing House.

Paper – II(Paper Code-0804)
DESCRIPTIVE STATISTICS

Unit - I

Origin and Development of statistical importance, uses and limitations of Statistics. Types of Data: Concepts of a statistics population and sample from a population; qualitative and quantitative data; nominal and ordinal data; cross sectional and time series data; discrete and continuous data; frequency and non-frequency data.

Collection and Scrutiny of Data; Primary data – designing a questionnaire and a schedule; checking their consistency. Secondary data – their major sources including some government publications. Complete enumeration, controlled experiments, observational studies and sample surveys. Scrutiny of data for internal consistency and detection of errors of recording. Ideas of cross-validation.

Presentation of Data: Construction of tables with one or more factors of classification. Diagrammatic and graphical representation of non-frequency data. Frequency distributions, cumulative frequency distributions and their graphical and diagrammatic representation – column diagram, histogram, frequency polygon and ogives. Stem and leaf chart. Box plot.

Unit -II

Analysis of Quantitative Data: Univariate data: Concepts of central tendency or location, and their measures; arithmetic, geometric and harmonic mean, median and mode.

Unit -III

Dispersion and relative measures of dispersion, skewness and kurtosis, and their measures including those based on quartiles and moments. Sheppard's corrections for moments for grouped data (without deviation).

Unit -IV

Bivariate data: Scatter diagram. Product moment correlation coefficient and its properties. Coefficient of determination. Correlation ratio. Concepts of regression. intra - class correlation coefficient with equal and unequal group sizes. Rank correlation – Spearman's and Kendall's measures. Correlation index. Principle of least squares. Fitting of linear and quadratic regression and related results. Fitting of curves reducible to polynomials by log and inverse transformation. Multivariate data: Multiple regression, multiple correlation and partial correlation in 3 variables. Their measures and related results.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.

2.Croxton FE, Cowden DJ and Klein S: Applied General Statistics (1973): Prentice Hall of India.

3.Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Vol. 1(1991) & Vol. 2(2001). World Press, Calcutta.

5.Gupta V.K. and Kapor S.C. : Fundamentals of Mathematical Statistics S. Chand and Sons.

ADDITIONAl REFERENCES:

6.Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.

7. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, McGraw Hill.

8.Snedecor GW and Cochran WG: Statistical Methods (1967) : Lowa State University Press.

9.Spiegel, MR (1967): Theory & Problems of Statistics (1967): Schaum's Publishing Series.

Paper III

Practical: Practical Based on Paper I & II

1. Presentation of data by Frequency tables, diagrams and graphs.
2. Calculation of Measures of Central Tendency, dispersion , skewness and kurtosis
3. Product Moment Correlation and Correlation Ratio
4. Fitting of Curves by the least square method
5. Regression of two variables
6. Spearman's Rank correlation Coefficient
7. Multiple regression of three variables
8. Multiple correlation and partial correlation
9. Evaluation of probabilities using addition and multiplication theorems, conditional probabilities and Bayes theorems
10. Exercises on mathematical expectations and finding measures of central tendency, dispersion, skewness and kurtosis of univariate probability distributions
11. Fitting of univariate and conditional distributions

DEFENCE - STUDIES

PAPER - I

INDIAN MILITATY HISRORY M.M. 50

(paper code - 0817)

AIM : The main idea behind this paper is to give a conceptual background about the events and factors which infleenced course of history and helped in developing the art of war in India.

Note : Questions will be set from each unit, There will be only internal choice.

UNIT-1 1. The definition and scope of Defence Studies and its relationship with other subjects.

2. Art of war of Epic and Puranic period.
3. Comparative study of lndo-Greek art of war with special reference to the Battle of Hydaspus 326 B.C.
4. Mauryan Military system and art of war.

UNIT-2 1. Kautalya's Philosophy of war.

2. Gupta's military system and art of war.
3. Military system of Harshavardhan.
4. Dicline of Chariots and Importance of Elephant and Cavalory.

UNIT-3 1. Mughal military system.

2. Rajput and Turk pattern of warfare with speci of reference to Battle of Somnath and Battle of Tarain up to 12th century A.D.
3. Causes of the fall pf Rajput Military system.
4. Army organization during Sultanate period.
5. Battle of Panipat 1526 A.D. and Battle of Haldighati 1576 A.D.

UNIT-4 1. Maratha Military system.

2. Warfare of Shivaji.
3. Battle of Assaye 1803 A.D.
4. Sikh Military system.
5. Battle of Sobraon 1846 A.D

UNIT-5 1 . 1857 Liberation Movement.

2. Reorganizations of Indian Army under the, Crown.
3. Nationalization of, Indian Army after independence.
4. Military reforms of Lord Kitchner's.

READING LIST :

1. Military System of Anciant India : B.K. Majumdar
2. Generalship of Alexander the Great : J.F.C.Fuller
3. Kautilya Arthashastra : K.P. Kanbley
4. Military history of India : J.N. Sarkar

PAPER - II

DEFENCE MECHANISM OF THE MODERN STATE

(paper code - 0818)

AIM : To enable students to appreciate the importance of higher political direction in the formulation of national defence policy and roles as political and military leadership in furthering national security.

Note : Question will be from each unit, there will be only internal choice.

UNIT-1 1. Evolution of National defence policy.

2. Inter dependence of Foreign, Defence and Economics policies.
3. Higher defence organization of U.S.A., U.K. and RUSSIA.
4. Higher defence organization of CHINA, PAKISTAN and NATO.

UNIT-2 1. Higher defence organization in India.

2. Powers of President and relation to Armed forces.
3. Parliament and the Armed forces.
4. Defence (Political affair) committee of the cabinet. Its composition, methods of working during war and peace.
5. National Defence Council and its Valiant.

UNIT-3 1. Organization of Ministry of Defence.

2. Organization of Army head quarter.
3. Organization of Naval head quarter.
4. Orgatiization of Air head quarter.

UNIT-4 1. Organization and role of Para-militaty forces - B.S.F., I.T.B.P., C.I.S.F. etc.

2. Organization and role of Intelligence Agencies - RAW, CBI, CID., IB etc.
3. Military Intelligence.
4. Role of N.C.C. in preparing youth for Defence services.

UNIT-5 1. Organization of Civil - defence.

2. Importance and role of civil defence during war and peace.
3. Air-Raid signal and precaution before and after bombardment.
3. Role of Indian armed forces in war and peace.

READING LIST :

1. Indian Army, A Sketch of its History & Organisation : E.H.E. Choen
2. Defence Organization in India : Venkateshwarm

PRACTICAL **M.M. : 50**

There shall be practicall examination ot 3 hours duration and carying 50 marks. The distribution of marks shall be as follows -

1. Exercises based on Map reading : 20 Marks
2. Exercises based on models : 10 Marks
3. Sessional Work and Record : 10 Marks
4. Viva-Voce : 10 Marks,

PART - A

ELEMENTARY MAP READING

1. Maps- Difination, types, Marginal Information.
2. Conventional signs - Military and Geographical.
3. Direction and cardinal points.
4. Types of North, Angle of Convergence.
5. Study of Liquid compass, its parts, various tactical uses and preparation of Night navigation chart.
6. service Protractor and its uses.
7. To find North by Compass, Watch, Sun, Stars etc.
8. Bearing and interconversion of bearing.
9. Setting of Map.
10. Grid System.

PART - B

RECOGNITION & ELEMENTRY STUDY OF FOLLOWING MODELS

1. equivalent Rank and Badges of Indian Army, Navy and Air Force.
2. Famous Armoured vehicles used in war.
3. Weapons used in Infantry.
4. Various Ships of Indian Navy.
5. Famous Air-Crafts Used by Air-Force.

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INDUSTRIAL CHEMISTRY

PAPER - I

INDUSTRIAL ASPECTS, OF ORGANIC & INORGANIC CHEMISTRY

(paper code - 0821)

UNIT-1 1.1 Nomenclature Generic names, Rade names.

1.2 Raw Materials for Organic compounds :-

Petroleum, natural gas, Fractionation of Crude oil.

UNIT-2 2.1. Petrolutri :- Cracking, reforming Hydroforming isomerisaton.

2.2. Coal :- Types, Structure,' Properties, distillation of coal', chemicals derived there from.

UNIT-33.1.Renewable natural resources :- Cellulose, starch, properties, modification, impor-tant ind. Chemicals derived from them, Alcohol and alcohol based chemicals, Ox-alic acid, Furfural.

3.2. Basic metallurgical operations':- PuIverisation, calcination, Roasting, refining.

UNIT-4 4.1 Physico chemical principles of extraction of,:- Iron, Copper, Lead, Silver, Sodium, Aluminium, Magnesium, Zinc, Chromium.

UNIT-5 Inorganic materials of Industrial Importance :- Their availablility, forms, structure arid modification. Alumina, Silica, Silicates, Clays, Mica, Carbon, Zeolites.

BOOKS :

1. Coal Conversion, E.J. Hoggman, The Energon Co., Lavamic Wyomnig, U.S.A.
2. Introduction of Petroleum Chemicals, H. Steiner, Pergamen Press.
3. From Agrocarbon to Petrochemicals, L.F. Hatch & S. Matarm, Gulf Publishing Co., Houston.
4. Colten Cellutose : Its Chemistry & Technology, Hall A.G.
5. Methods in Carbohydrate Chemistry, Vol. 3 - Cellulose, Whistler, R.L.
6. Chemistry of Cellulose, Heuser, E.
7. Chemistry & Industry of Starch, Kerr, R.W.
8. Modified Starches : Properties & Uses, Wurzburg, O.B.
9. Principles of Extractive Metallurgy, Herbashi, Vol. I & II.
10. Theory of Metellurgical Processes, Volsky, A. & Sergievskaya, F.
11. Text book of Metallurg, Baiky, A.R.
12. Clays, H. Reis, John Wileys & Sons.
13. Unit Processes of Extractive Metallurgy, Pehike, Elserier Publication.
14. Industrial Chemistry, Reigel, Reinhold Publication.

PAPER - II

INDUSTRIAL ASPECTS OF PHYSICAL CHEMISTRY

MATERIAL AND ENERGY BALANCE

(paper code - 0822)

UNIT-1 Surface. chemistry and Interfacial Phenomena Adsorption lsotherm, Sols, Gels, Emulions, Micoemulsions,.micelles, Aerosols, Effect of surfacttants, Hydrotropes.

UNIT-2 Calalysts :- Introduction, Types, Homog-eneous and Heterogeneous, Basic Principles, Mechanisms factors affecting the performance, Introduction to phase transfer catalysis

UNIT-3 3.1. Enzyme catalysed reactions - Rate model, Industrially important reactions.

3.2. Material Balance without chemical Reactions:- flow diagram formaterial balance, simple material with or without recycle or by-pass for chemical engineering opera-tions such as distillation, crystallisation, evaporation, extraction, etc.

UNIT-4 4.1. Dimensions and Units :- Basic. chemical calculations -Atomic weight, molecular, weight, equivalent weight, mole composition of (i) liquid mixt'ure & (ii) gaseous mixture.

4.2. Material balance involving chemical reaction :- concept of limiting reactant, con-version, yield liquid phase reaction, gas phase reactions with/without recycle or by-pass.

UNIT-5 Energy Balance :- Heat capacity of p-ure gases and gaseous mixtures at constant pres sures. Sensible heat changes. in liquids, Enthalpy changes.

BOOKS :

1. Aersol, Science & Technology, Shephered, H.R.
2. Catalysir :Heterogeneons & Homogeneous, Delmon, Elbevior Scienu Publication.
3. Catalysir, Science & Technology, Anderson, J.
4. Catalysir in Micelller & Macromolecular systems, Fendler & Fendler.
5. Phase Transfer Catalysis, Principle & Techniques, Strles, C.
6. Surgace Chemistry, J.J. Bikermann, Academic Press.
7. Physical Chemistry of Surfaces by A.W. Admson.
8. Storchiometry, B.I. Bhalt & S.M. Vora.
9. Chamical Process Principle - Part I, B.A. Hougen, K.M. Watson & R.A. Ragats, Asia Publi-cation.

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

PAPER - III

UNIT OPERATIONS IN CHEMICAL INDUSTRY AND UTILITIES, FLUID FLOW AND HEAT TRASNPORT IN INDUSTRY

(paper code - 0823)

UNIT-1 1.1. Distillation - Introduction; Batch and continuous distillation, separation of azeo-tropes, plate columns & packed,columns.

1.2. Absorption - Introduction, Equipments- Packed columns, spray columns, bubble columns, palcked bubble columns, mechanically, agitated contractors.

UNIT-2 2.1 Evaporation - Introduction, Equipm ‘ ents - short tube (standard) evaporator, forced circulation evaporators, falling film evaporators, climbing film (Upward flow) evaporatiors, wiped (agitated) film evaporator.

2.2 Filtration - Introduction, filter media and filter aids, Equipments- Plate and frame,filter press, nutch filter, rotatory drum filter, spartkler filter, candle filter, bahgfifter, cen-trifuge.

2.3 Drying - Introdunction, free moisture, bound. moisture,drying curve, Equipments tray dryer, rotatory dryer, flash drater, fluid bed dryer, drum dryer, spray dryer.

UNIT-3 3.1 Utilities in chemical Industry

Fuel - Types of fuels -advantages and disadvantages, combustion of fuels, calortific value. specification for fuel oil.

Boilers - Types of.-boilers and their functioning.

Water - Specifications fof industrial use, various water treatments.

Steam - Generation and use.

Air - Specifications for Industrial use processing of air.

UNIT-4 Fluid Flow : Fans, blowers, compressors, vacuum pumps, ejector. Pumps :-

Reciprocating pumps,, Gear pumps,. centrifugal pumps.

UNIT-5 Heat Exchangers -: Shall and Tube type; finned tube heat exchangers, plate heat ex-changers, refrigeration cycles.

BOOKS :

1. Introduction Chemical Engineering, W.L. Badger, J.J. Banchero, McGraw Hill.
2. Unit Operations in Chemical Engineering, W.L. McCabe & J.C. Smith, McGraw Hill.
3. Chemical Engineer's Hand Book, J.H. Perry, McGraw Hill.
4. Unit Operations - I & II, D.D. Kale, Pune Vidyarthi Griha Prakashan, Pune.
5. Unit Operations of Chemical Engineering, Vol. I, P. Chattopadhyay, Khanna Publishers, Delhi.

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

PRACTICAL

Duration of Examination :			**04 Hrs.**
Discription of marks	Experiment	:	30 marks
	Viva	:	05 marks
	Sessional	:	05 marks
	Project	:	40 marks
	Total	**:**	**80 marks**

EXPERIMENTS TO BE PERFORMED :

1. Simple laboratory tecniques crystallisation, Fraction Crystallisation, Distillation, Fractional distillation Boiling Point.Diagram.
2. Extraction Processes- Phase diagram, partition$_{HSO}$co-efficient.
3. Preparation of standard solutions- Primary^{2} and^{4}secondary standards, Determination of- and H_3PO_4 in a mixture.
4. Calibration of Thermometres.
5. Acquaintance with safety measures in a laboratory Hazards of Chemicals.
6. Depression and elevation in.b.p./m.p. of solids and liquids.
7. Chromatography-column, Paper, Thin layer.
8. Ore analysis dolomite, limestone, -calcite, Analysis of alloys such as cupro-nickel.
9. Determination of Physical Constants
   Refractive -index, surface tension, Effect of surfactants, on surface tension, viscosity- Fluids, Polymer solutions effect of additives on viscocity, optical rotation.
10. Study, experimenfs/demonstration experiments.

Note : Any two experiments have to be carried out by the students in the Examination. A Mini mum of 60% of the'experiments have to be conducted by the students.

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B. SC. PART - I
COMPUTER SCIENCE
PAPER - I
COMPUTER FUNDAMENTALS
PAPER CODE - 0805

MAX MARKS - 50

Note:- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I CLASSIFICATION AND ORGANISATION OF COMPUTERS

History of computer, Generation of computer, calculator vs computer. Digital and Analogue computers and its evolution. Major components of digital computers, Memory addressing capability of CPU. Word length and processing speed of computers, Microprocessors, Single chip Microcomputer, Large and small computers, Users interface, hardware, software and firmware, multiprogramming multiuser system, Dumb smart and intelligent terminals, computers Network and multiprocessing LAN parallel processing, Finn's classification of computers control flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT

Parts of CPU-ALU control unit, Registers; Architecture of Intel 8085 microprocessor, Instruction for Intel 8085 microprocessor, Instruction Word size, Various addressing mode, Interrupts some special control signals, Instruction cycle fetch and execute operation, Timing Diagram, Instruction flow and data flow.

UNIT-III MEMORY

Memory hierarchy, Primary and Secondary Memory, Cache memory, Virtual Memory, Direct Access storage devices (DASD) Destructive and Non-destructive Readout, Program and data memory, Memory Management Unit (MMU) PCMCIA cards and Slots.

UNIT-IV I/O DEVICE

I/O devices-Keyboard, Mouse, Monitor, Impact and Non-Impact Printers, Plotters, Scanner, other Input/output devices: Scan method of Display, Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port, Programmable and Non Programmable I/O port, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Microcontroller, Signal Processor, I/O processor, Arithmetic Processor.

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software: Introduction, Example, Difference etc. Introduction to Open Source Software such as Unix/Linux (Ubuntu), Liber office etc. Introduction to Machine Language Assembly Language and High Level Language; Programming Techniques, Stack Subroutine, Debugging of programs, Macro Program Design Software Development, Flow Chart, Multiprogramming, Multiuser, Multitasking Protection, Operating system and Utility programs Application packages

TEXT BOOK

1. Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
2. Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition.
3. Fundamentals of Computers, V. Rajaraman, PHI Sixth Edition.
4. Computers Today, Donald H. Sanders, McGraw-Hill Third Edition.
5. IBM PC and Clones, B. Govindarajulu, McGraw-Hill Second Edition.
6. UNIX Concepts and Applications, Sumitabha Das, Tata McGraw-Hill Fourth Edition.

B. SC. PART - I
COMPUTER SCIENCE
PAPER - II
PROGRAMMING IN C LANGUAGE
PAPER CODE - 0806

MAX MARKS - 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming - Overview of C : History of 'C', Structure of 'C' program. Keywords,Tokens,Datatypes,Constants,LiteralsandVariables,OperatorsandExpressions:Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associativity, Type casting, Console I/O formatting, Unformatted I/O functions: getch(),getchar(), getche(), getc(), putc(), putchar().

UNIT-II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: For, do.while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions:-Definition, function components: Function arguments, return value, function call statement, function prototype. Type of function Scope and lifetime of variable. Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array:-Array declaration, one and two dimensional numeric and character arrays. Multidimensional arrays.

String:-String declaration, initialization, and string manipulation with/without using library function.

Structure, Union & Enum- Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, functionreturningstructure.**Union**:basics,declaringunionandunionvariable,**Enum**:declaringenumanden umvariable.

UNIT-IV

Pointers: Definition of pointers, Pointer declaration, Using &and* operators. Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions–malloc, calloc, realloc and free, Pointers vs. Arrays, Arrays of pointer, pointer to array, Pointers to functions ,Function returning pointer, Passing function as Argumenttofunction,Pointertostructure,Dynamicarrayofstructurethroughpointertostructure.

UNIT-V

File Handling and Miscellaneous Features-Filehandling:filepointer,F ileaccessingfunctions,:fopen, fclose,fputc,fgetc,fprintf,fscanf,fread,fwrite,beof,fflush,rewind,fseek,ferror.File handling through command line argument. Introduction to C preprocess or #include, #define, conditional compilation directives:#if,#else,#elif, #endif, #ifndefetc.

TEXTBOOKS

1. Programming in ANCII. Balagurusamy c Tata McGgraw-Hill third edition.
2. Let Us C, Yashwant Kanetkar Infiniti science Press, 8th edition.
3. Mastering C, K.R. Venugopal Tata McGgraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis, M Ritchic, Prentice Hall Second Edition.
5. Application programming in ANSI C, R. Johnsonbaugh, Martins Kalin, Macmillan Second Edition.
6. The Spirit of C Mullish Cooper, Jaico Publishing House.
7. How to solve it by computer, R.G. Dromeypearson edition.

ELECTRONICS EQUIPMENT MAINTENANCE
PAPER - I
PRINCIPLES OF ELECTRONICS
(paper code - 0809)

UNIT-1 General information : Symbol, colour code, types (Such an carbon, mental film, thin-film thick-fillm, wire-wound), Variable resistors potentiometers (logarithmic linear multi-turn wire wound rheostate.

Physical properties : Temperature dependence (Thermistor), Light Dependencs (LDR),

Voltage Dependence (VDR).technical specification wattage and working voltages. Methods of measurement of resistance: very low to very high values.

INDUCTORS : General Information: symbol, Types each as air core, iron core, ferrite core, chocking inductors (Coil), frequency response of an inductor.

Method of measurement of inductances: using universal bridges design and fabrication rules.

CAPACITORS : General infortnation : symbol, colour code, types of capacitors such as

Air, paper, Electrolytic, Mica, Tentalum Polyuterene, fixed and variable capacitors. Mea-surement of Capacitance: universal bridge. application areas.
BATFERIES : Dry Cells, Lead-Acid Accumulators, Nickel Cadrnlum cells, standard cells, principles, Specifications.
FUSES : Fast and Slow Fuses, Pilot Lamps.
PCB : Types of PCB, layout techniques, cables and connectors for PCB

UNIT-2 TRANSFORMERS: General information- principle, types of transformer such as single phase, auto mains and isolation transformers. Frequency dependence of transformer theoriern. (Audio, IF and RF), Design of mains transformers and CVT.

RELAYS : General ihformation: symbol, types of relays, such as rend electromagnefic. Specifications, rating, application areas.

MICROPHONES AND LOUDSPEAKERS : General information: frequency response, input and output Impodance, power rating, directionality (omns and unli-directional). Application areas.
TRANSDUCERS : Commonly used transducers, L.D.R., thermistars thermocouples, phatodioden, pholc transistors, IR detectors L Volt.

UNIT-3 SWITCHES, CABLE AND CONNECTORS : Spdl, dpdl, band switches, touch switches, thumpwheel switches, rnicro switches, specifications, application areas.

NETWORK THEOREMS : Kirchoffs current and voltage law, -maximurr. power transfer,

THEOREMT : bevenins theorem, norton's theorem, super position theorem.

LCR AND WAVESHAPING CIRCLITS : Serial and parallal response, idea of black Nix., qwivalent circuits. Idea of two terminal and two part network, eqi&alent cirewits. Integra-tion, differer lation using R.C. circuits, *chpping clampaig.*

UNIT-4 NUMBER SYSTEMS : Introduction to decimal bmiazy, octal floca decial, number system interconversions of decimals binary and BCD number. Binary arithmetic and Boolean algebr& Boolean axiom, D Morgan's theorms-statement vanfication and applications.

LOGIC GATES : Posifive and Negative logic, different logic gate, such as AND, OR NOT, NAI, NOF, EXOR, symbol and truth tables. Inverting a non-irverting suffers.

LOGIC.FAMILIES : TTL, ECL & CMOS parameters like power dissipation, speed, sup-ply requirements, logic level, fan in, fan out noise half addar, full addar, half subtulor.

UNIT-5 COMBINATIONAL CIRCUITS : Encioder-decoder sequenfial circuits, flip flops (As,K,,D,I,N,S) -shift, registers, counte% Semiconductors memory.

PAPER - II
ELECTRONIC DEVICES, COMPONENTS & ASSEMBLIES
(paper code - 0810)

UNIT-1 INTRODUCTION- TO SEMI CONDUCTORS

ENERGY BAND DIAGRAM: conductors, semiconductor, insulation, intrinsic and exitrinsic sermi conductors (P.N. type), diffused junctions, depletion layer, barrier potential.

JUNCTION DIODES : Rectifying diode, forward and reverse bias characteris tic, switch-ing diode, varacleor diode, photo diode. light ernitting diode, IR sources and delector optical isolators, Zener diode, Tunnel diode, tunnel diode.

BIPOLAR JUNCTION TRANSISTORS : Basic working principle (qualitative), characterstic, Basic configurations and baising. Operating point, load line, biasmig for stabilization of operating point.

UINT-2 JEFT & MOSFET: Basic working principle (qualitative), charactenistic Binchoff voltage,

UNI JUNCTION TRANSISTORS : Basic working principle (qualitative), characterstic applications, as a switch.

POWER CONTROL DEVICES : Four layer diode (PNPN), Sillicon conq-olled, rectifier
(SCR) tracis, diac, principle & characteristics.

AMPLIFIERS : Different terms used in amplifers, sucn as signal fource ssource, input output, voltage and current gain power gain,- decibel , input and'output impendance.

Classification according to the frequency response, RC coupled, class A common emit-ter Amplifier, Introduction to the class & operafion

FEED BACK IN AMPLIFIER : Effect of negative feedback on amplifier performance.

UNIT-3 POWER AMPLIFIER : Transformer coupled equivalent circuit only in brief, class A, class B. class AB and class C the constant power hyperbola, the AC load line input and output considerations, determination of Non-hner distortion.

PUSH-PULL AMPLIFIERS : Phase splitter circuits, complimentary push-pull, thermal ranway, Heat sinks.
Class B and C resonant load amplifiers, graphical class C analysis, **resonant** load requirements.

OPERATIONAL AMPLIFIER :

Basic, idea of an OPAMP with black box concept miverting and noninverting inputs, virtual ground

Parameters such as input impendance, output impendance, open loop gain, measure-ments of parameters.

Qualitative description of OPAMP as mverting and non inverting arnphfier, summing and. difference amplifier, comparater and linear ubtegratirs, instrumentation amplifier.

UNIT-4 OSCILLATORS : Positive feedback, barkhausen criltenia, phase shift oscillators, wei bridge oscillators Tuned oscillators, Hartley, colpits-oscillators, crystal oscillator.

POWER SUPPLIES : Regulated power supply, Zener regulated power supply series and shunt regulated power supply, block diagrain of IC 723, regulated supply of IC 723.

11iree ter~nal Ics power supply. Study of power supply. w.r. to variation ‘in loadand I ‘me voltage.

SWITCHED MODE POWER SUPPLY : Design principle, and application. **IC 555** : Operations and applications.

UNIT-5 MODULATION : AM and FM : Principles, modulation, index, modulation, bandwidth, balanced modulator,

DEMODULATION : Am and Fm delectors diode detectors, ratio detector, balanced de-modulator’.

Introduction to communication systems, basic principles and operation of communica-tion system.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2019-20

June 2019 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement CoursePractical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B . S c . P a r t I

ELECTRONICS

Paper-I

ELB-101: NETWORK ANALYSIS AND ANALOGELECTRONICS

Theory: **Maximum Marks 50**

Unit-1

Basic Circuit Concepts: Voltage and Current Sources, Review of Resistors, Inductors, Capacitors. Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL),

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak,Peak to Peak, Root Mean Square and Average Values. AC applied to Series RC and RL circuits: Impedance of series RC & RL circuits.AC applied to Series and parallel RLC circuit, Series and Parallel Resonance, condition for Resonance, Resonant Frequency, Bandwidth, and significance of Quality Factor (Q).

Passive Filters: Low Pass, High Pass.

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem,Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems.

Unit-2

Junction Diode and its applications: PN junction diode (Ideal and practical)-constructions, Formation of Depletion Layer, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, dc load line analysis, Quiescent (Q) point. Zener diode, Reverse saturation current, Zener and avalanche breakdown. Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Filter-Shunt capacitor filter, its role in power supply, output waveform, and working. Regulation- Line and load regulation, Zener diode as voltage regulator, and explanationfor load and line regulation.

Unit-3

Bipolar Junction Transistor: CE, CB Characteristics and regions of operation, Transistor biasing, DC load line, operating point, thermal runaway, idea about stability and stability factor. Voltage divider bias, circuit diagrams and their working.

Field Effect Transistors: JFET, Construction, Working and Characteristics. MOSFET, Construction, Working and Characteristics.

Power Devices: UJT, Construction, Working and Characteristics. SCR, Diac, Triac, Construction, Working and Characteristics and Applications.

Unit-4

Amplifiers: Transistor biasing and Stabilization circuits- Fixed Bias and VoltageDivider Bias. Thermal runaway, stability and stability factor S. Transistor as a two port network, h-parameter equivalent circuit. Small signal analysis of single stage CE amplifier. Input and Output impedance, Current and Voltage gains. Class A, B and CAmplifiers.

Cascaded Amplifiers: Two stage RC Coupled Amplifier and its Frequency Response.

Unit-5

Feedback in Amplifiers: Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only).

Sinusoidal Oscillators: Barkhausen criterion for sustained oscillations. Phase shift,Weins bridge, Crystal andColpitt's oscillator. Determination of Frequency and Condition of oscillation.

Reference Books:

[1] Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)

[2] Electrical Circuits, M. Nahvi& J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)

[3] Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press

[4] Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.

[5] Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.

[6] Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, Tata McGraw Hill

[7] Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning

[8] Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6thEdn., Oxford University Press.

[9] J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)

[10] J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)

Paper- II

ELB-102: LINEAR AND DIGITAL INTEGRATEDCIRCUITS

Theory: **Maximum Marks 50**

Unit-1

Operational Amplifiers (Black box approach): Characteristics of an Ideal and Practical Operational Amplifier (IC 741), Open and closed loop configuration, Frequency Response. CMRR. Slew Rate and concept of Virtual Ground.

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Summing and Difference Amplifier, (3) Differentiator, (4) Integrator, (5) Wein bridge oscillator, (6) Comparator and Zero-crossing detector, and (7) Active low pass and high pass, Butterworth filter (1st order only).

Unit-2

Number System and Codes: Decimal, Binary, Octal and Hexadecimal number systems base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal arithmetic; addition, subtraction by 2's complement method, multiplication.

Logic Gates and Boolean algebra: Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra.

Unit-3

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP).Arithmetic Circuits: Binary Addition. Half and Full Adder.Half and Full Subtractor, 4-bit binary Adder/Subtractor.

Data processing circuits: Multiplexers, De-multiplexers, Decoders, Encoders. Clock and Timer (IC 555): Introduction, Block diagram of IC 555, Astable and Monostable multivibrator circuits.

Unit-4

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. Master-slave JK Flip-Flop.

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter Synchronous Counter.

Unit-5

D-A and A-D Conversion: 4 bit binary weighted and R-2R D-A converters, circuit and working, Accuracy and Resolution. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Reference Books:

[1] OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall

[2] Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011, Oxford University Press.

[3] Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw

[4] Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.

[5] Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.

[6] Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.

[7] Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)

[8] R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

ELECTRONICS LAB

ELB 104P: LINEAR AND DIGITAL INTEGRATED CIRCUITS LAB

Max.Marks:25

At least 04 experiments each from section A, B and C

Section-A: Op-Amp. Circuits (Hardware)

1. To design an inverting amplifier using Op-amp (741,351)for dc voltage of given gain
2. (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response
   (b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response
3. (a) To add two dc voltages using Op-amp in inverting and non-inverting mode
   (b) To study the zero-crossing detector and comparator.
4. To design a precision Differential amplifier of given I/O specification using Op-amp.
5. To investigate the use of an op-amp as an Integrator.
6. To investigate the use of an op-amp as a Differentiator.
7. To design a Wien bridge oscillator for given frequency using an op-amp.
8. To design a circuit to simulate the solution of simultaneous equation and $1^{st}/2^{nd}$order differential equation.
9. Design a Butterworth Low Pass active Filter (1st order) & study Frequency Response
10. Design a Butterworth High Pass active Filter (1st order) & study Frequency Response
11. Design a digital to analog converter (DAC) of given specifications.

Section-B: Digital circuits (Hardware)

1. (a) To design a combinational logic system for a specified Truth Table.
   (b) To convert Boolean expression into logic circuit & design it using logic gate ICs.
   (c) To minimize a given logic circuit.
2. Half Adder and Full Adder.
3. Half Subtractor and Full Subtractor.
4. 4 bit binary adder and adder-subtractor using Full adder IC.
5. To design a seven segment decoder.
6. To design an AstableMultivibrator of given specification using IC 555 Timer.
7. To design a MonostableMultivibrator of given specification using IC 555 Timer.
8. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
9. To build JK Master-slave flip-flop using Flip-Flop ICs
10. To build a Counter using D-type/JK Flip-Flop ICs and study timing diagram.
11. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs.

Section-C: SPICE/MULTISIM simulations for electronic circuits and devices

1. To verify the Thevenin and Norton Theorems.
2. Design and analyze the series and parallel LCR circuits
3. Design the inverting and non-inverting amplifier using an Op-Amp of given gain
4. Design and Verification of op-amp as integrator and differentiator
5. Design the 1storder active low pass and high pass filters of given cutoff frequency
6. Design a Wein`s Bridge oscillator of given frequency.
7. Design clocked SR and JK Flip-Flop`s using NAND Gates
8. Design 4-bit asynchronous counter using Flip-Flop ICs
9. Design the CE amplifier of a given gain and its frequency response.

Reference Books

1. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4thedn., 2000, Prentice Hall
3. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
4. Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill

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B.Sc. Part-I
INFORMATION TECHNOLOGY
PAPER-I
FUNDAMENTAL OF IT, COMPUTER AND PC SOFTWARE
(PAPER CODE-0824)

NOTE : The Question paper setter is advised to prepare unit wise question with the provision of internal choice

MAX MARKS : 50

UNIT-I INFORMATION TECHNOLOGY

Concept of IT and information system, Application of IT (In Business, Education Medicine Science Governance and Agriculture) Impact of IT on society E and industry, Legal and Ethical aspect of IT, Security and Threats in IT, M-Commerce, Virtual reality, latest trend in IT, future of IT.

UNIT-II COMPUTER NETWORK

BASIC CONCEPT OF COMPUTER NETWORK Internet concept **LAN, MAN, WAN** Topology, Protocol, Transmission mode Communication Process Required element of data communication.

WIRELESS COMMUNICATION Mobile Internet GPS,3G, 4G Wi-Fi Bluetooth infrared radio frequency microwave.

SOCIAL NETWORK Evolutions of social network site (YouTube, Facebook, LinkedIn Twitter) Advantages and Disadvantage of social networking sites.

UNIT-III MS WORD

Introduction word processing (MS-Word) Advantage of word processing, Introduction and Installation Editing a file using paragraph styles, Newspaper style columns using macros advanced word processing, Headers and Footers, Finding text setting up printer Mail merge and other applications, mathematical calculator, table handling.

UNIT-IV MS-EXCEL

Introduction to spreadsheets (MS-EXCEL), Definition and advantage of electronics worksheet, Working on spread sheets range and related operations, Setting saving and retrieving worksheets Inserting, Deleting, Copying and Moving of data cells, Inserting and deleting rows and column, protecting Cells Printing a worksheet, erasing a worksheet in Graphs creations, Type of graphs, Creating a chart sheet 3D, Columns charts, Moving and changing the size of chart, Printing the chart.

UNIT-V MS POWERPOINT AND MS ACCESS

MS-POWERPOINT: Presenting with Power point: Creating presentation working with slides, Different type of slides, Settings page layout, Selecting background and applying designs, Adding graphics to slide, Adding sound and movie, Creating chart and graph, Playing a slide show, slide transition, Advancing slide, Setting time, Rehashing timing, Animating slide, Animating objects, Running the show from window.

MS ACCESS: Creating table in access define data type Manipulating records.

TEXTBOOKS

1. Computer fundamental R.K.Sinha BPB Publication Sixth edition.
2. Introduction to Information Technology V Raja Raman PHI Second Edition.
3. Computer Networks Forouzan Tata McGraw Hill Second Edition.
4. Microsoft Office 2007 fundamentals L Story D walls.
5. MS Office, S.S.Srivastava Firewall media.

B. SC. PART - I
INFORMATION TECHNOLOGY
PAPER - II
PRAMMING IN C LANGUAGE

MAX MARKS - 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming - Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Datatypes, Constants, Literals and Variables, Operators and Expressions : Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associativity,Typecasting,ConsoleI/Oformatting,UnformattedI/Ofunctions:getch(),getchar,getche(), getc(),putc(),putchar().

UNIT-II

Control Constructs : If-else, conditional operators, switch and break, nested conditional branching statements, loops: do...While, while, for, Nested loops, break and continue, goto and label, exit function.
Functions:-definition, function components: Function arguments, return value, function call statement, function prototype. Type of function Scope and lifetime of variable. Call by value and call by reference. Function using arrays, function with command line argument. User defined function: Maths and character functions, Recursive function.

UNIT-III

Arrays, Strings and Functions: Array:-Array declaration, One and Two dimensional numeric and character arrays. Multidimensional arrays.
String:-String declaration, initialization and string manipulation with/without using library function.
Structure, Union &Enum- Structure: basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable. **Enum** : declaring enum and enum variable.

UNIT-IV

Pointers: Definition of pointers, pointer declaration, using &and* operators. Void pointer, pointer to pointer, Pointer in math expression, Pointer arithmetic, pointer comparison, dynamic memory allocation functions–malloc, calloc, realloc and free, pointers vs Array, Arrays of pointer, Pointer to array, Pointers to function, function returning pointer, passing function as argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features- File handling: file pointer, file accessing functions,: fopen, fclose,fputc,fgetc,fprintf,fscanf,fread,fwrite,beof,fflush,rewind,fseek,ferror.File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives:#if,#else,#elif,#endif,#ifndefetc.

TEXTBOOKS

1. Programming in ANCI E. Balagurusamy c Tata McGraw-Hill third edition.
2. Let Us C, Yashwant Kanetkar Infiniti science Press, Eighth edition.
3. Mastering C, K.R. Venugopal Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis, M Ritchic, Prentice Hall Second Edition.
5. Application programming in ANSI C, R. Johnsonbaugh, Martins Kalin, Macmillan Second Edition.
6. The Spirite of C Mullish Cooper, Jaico Publishing House.
7. How to solve it by computer, R.G. Dromey person edition.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	General Microbiology, Tools and Techniques	3 hrs.	50
Second	Molecular Biology, Biochemistry and Microbial Genetics	3 hrs.	50
	PRACTICAL (including sessionals)	4 hrs.	50 (40+10)

PAPER -

GENERAL MICROBIOLOGY, TOOLS AND TECHNIQUES M.M.50

I (paper code - 0826)

UNIT-1 History and development of Industrial Microbiology. Contributions of antony von Leeuwenhoek, Louis Pasteur, Robert Koch, Edward Jenner, Wakman, Alexandar Flaming.

UNIT-2 General characteristics and structure of Bacteria, Cyanobacteria, Fungi, Actino-mycetes, Mycoplasms, Vinuses.

UNIT-3 Microscopy - Invention of Microscope, Compound microscope, Dark field, Fluorescent, Phase contrast and Electron microscope.

UNIT-4 Method of sterilization, culture media and isolation techniques. Methods of preservation of microbial cultures.

UNIT-5 Basic principles and usage - pH meter, Densitometer, Colorimeter, Spectrophotometry, Fluori-metry, Centrifugation - Principles and applications. Usage of Fermentation.

PRACTICALS

The Practical works will, in general be based on the prescribed syllabhus in theory and the candidates will be required to show the knowledge of the following :

1. Preparation of media, autoclaving and sterilization of glassware.
2. Isolation of Phytopathogens.
3. Isolation of Microorganisms from soil and water : Bacteria, Fungi, and Algae.
4. Purification of microbial cultures.
5. Camera Lucida Drawing.
6. Standard Plate count.
7. Heamocytometer.
8. Chromatographic techniques : Separation of amino acids by paper and thin layer chromatography.
9. Measurement of pH of fruit juice.
10. Estimation of cargohydrate by colorimeter.

BOOK RECOMMENDED :

1. General Microbiology, Vol. II by Power and Daginawala.
2. Microbiology by Pelczar, Reid and chan.
3. General Microgiology by Davis and Harper.
4. A Treatise on Media and Methods Used in Bacteriological Techniques by V. Iswarn.
5. Introductory Mycology by C.J. Alexopoulous & Mims.
6. Microbiology by P.D. Sharma.

29/7/17 29/7/17

PAPER - II
MOLECULAR BIOLOGY, BIOCHEMISTRY AND MICROBIAL GENETICS
(paper code - 0827)

M.M. 50

UNIT-1 Nucleic Acids - Structure of DNA and RNA(s), Replication of DNA, Synthesis of RNAs and their types, Genetic code, Concept of genes.

UNIT-2 Molecular Biology - Translation and Protein Synthesis, Operon Concept, CAMP CAP (Catabolic activator protein), Gene expression in Prokaryotes, Lac-Operon. Gene ragulation in Eukaryotes (Britton-Davison Model of Gene Expression).

UNIT-3 Genetic recombination in Bacteria - Transformation, Transduction and conjugation, Genetic Mapping, Extrachromosomal genetic material, Plasmids, Cosmids, Transposons, Overlapping genes, Silent genes and their evolutionary significance. Mutation -Molecular mechanism of mutation, Chemical and Physical Mutagens, Repair of Mutation Damage.

UNIT-4 Biochemistry - Classification of carbohydrates, Chemical structure and property of starch, Cellulose, Glycogen, Synthesis of Purines & Pyrimidine.
Lipids - Saturated and unsaturated fatty acids, Biosynthesis of fatty acids, Distribution and functions of lipids in microorganisms, Degradation of lipids by O < B and Co oxidation, Lipid peroxidation.

UNIT-5 Enzymes - Classification. Co-enzymes, Cofactors, Mechanism of enzyme action, Competitive and non-competitive inhibition. Allosteric regulations of enzymes, isoenzymes, factors contributing to catalytic efficiency of enzymes.

Amino acids - Classification of essential amino acids based on polarity. Acid-base properties and solubilities. Amino acid sequencing of proteins; Primary, Secondary and Tertiary structure.

PRACTICAL

The Practical work will, in general, be based on the syllabus prescribed in theory and the candidates will be required to show the knowledge of the following -

1. Isolation of antibiotic resistant bacteria.
2. Extimation of alkaline phosphatase activity.
3. Measurement of o<amylase activity in extra-cellular fraction of microbial cultures.
4. Estimation of glycogen in bacterial cells.
5. Measurement of cellulase activity by Viscometric technique.
6. Determination of cellulase and amylase activity by reducing sugar assay test.
7. Isolation of DNA.

29/7/17 29/7/17

BOOK RECOMMENDED :

1. General Microbiology, Vol. 1 by Power & Daginawala.
2. Bicrobial Biochemistry by Moat.
3. Principles of Biochemistry by Lehninger.
4. Outline of Biochemistry by Cohn and Stumph.
5. Biochemistry by Harper.
6. Text book of Biochemistry by Rama Rao.
7. Text book of Biochemistry by O.P. Agrawal.

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29/7/17 29/7/17

BIO CHEMISTRY

PAPER-I

BIOMOLECULES **M.M. 50**

(paper code - 0832)

UNIT-I

Introduction to Biochemistry, water as a biological solvent, weak acids and bases, pH, buffers, Henderson-Hasselbalch equation, physiological buffers, fitness of the aqueous environment for living organisms.

CARBOHYDRATES

Structure of monosaccharides. Stereoisomerism and optical isomerism of sugars.

Reactions of aldehyde and ketone groups. Ring structure and anomeric forms, mutarotation. Reactions of sugar due to hydroxyl groups. Important derivatives of monosaccharides, disaccharides and trisaccharides (structure, occurrence and functions of important ones). Structure ocurrence and biological importance of monosaccharides, oligosaccharides and polysaccharides e.g. Cellulose, Chitin, agar, algenic acids, pectins, proteoglycans, sialic acids, blood group polysaccharides, glycogen and starch. Bacterial cell wall polysaccharides etc. Glycoproteins.

UNIT-II Lipids

Definition and classification. Fatty acids : introduction, classification, nomenclature, structure and properties of saturated and unsaturated fatty acids. Essential fatty acids, prostaglandins. Triacylglycerols: nomenclature, physical properties. chemical properities and characterzation of fats - hydrolysis, saponification value, rancidity of fats,

Reichert-Meissel number and reaction of glycerol. Biological significance of fats. Glycerophospholipids (lecithins, lysolecithins, cephalins, phosphatidyl serine, phos-phatidyl inositol, plasmalogens), sphingomyelins, glycolipids - cerebrosides, ganglio-sides. Properties and functions of phospholipids, isoprenoids and sterols.

UNIT-III Proteins

Introduction, classification based on solubility, shape, composition and functions.

Aminoacids: common structural features, stereo-isomerism and RS system of designating optical isomers, classification and chemical properties, titration of amino acids, separation of amino acids. Essential amino acids.

Peptides: structure of peptide bond, chemical synthesis of polypeptides - protection and deprotection of N-terminal, and C-terminal ends and functional groups in the side-chains, formation of peptide bonds, condensing agents, strategy of chemical synthesis, Merrifield solid-phase peptids sysnthesis. Determination of the amino acid sequence of a polypeptide chain, specific chemical and enzymatic cleavage of a polypeptide chains and separation of peptides. Protein structure: levels of structure in protein architecture, primary structure of proteins, secondary structure of proteins helix and pleated sheets, tertiary structure of proteins, forces stabilizing the tertiary structure and quaternary structure of proteins. Denaturation and renaturation of proteins. Behaviour of proteins in solutions, salting in and salting out of proteins.

Structure and biological functions of fibrous proteins (keratins, collagen and elastin), glooular proteins (hemoglobin, myoglobin), lipoproteins, metalloproteins, glycoproteins and nucleoproteins.

UNIT-IV Nature of genetic material: evidence that DNA is the genetic material, Composition of RNA and DNA, generalized structural plan of nucleic acids, nomenclature used in writing structure of nucleic acids, features of DNA double helix. Denaturation and annealing of DNA, structure and roles of different types of RNA Size of DNA in procaryotic and eucaryotic cells, central dogma of molecular biology, Gene, Genome, chromosome.

UNIT-V Porphyrins

Prophyrins: Porphyrin nucleus and classification of porphyrins. important Metalloporphyrins occurring in nature. Detection of porphyrins spectrophotometrically and by fluores-cence. Bile pigments - chemical nature and their physiological significance.

24.7.2017 24.7.17 24.7.17 24.7.17 24.7.17

PAPER - II

(paper code - 0833)

BIOPHYSICAL AND BIOCHEMICAL TECHNIQUES M.M. 50

UNIT-I Concepts of Bioenergetics

Principles of thermodynamics and their applications in biochemistry - introduction, thermodynamic system, thermodynamic state functions, first and second laws of thermodynamics, concept of free energy, standard free energy, determination of G for a reaction, relation between equilibrium constant and standard free energy change, biological standard state and standard free energy change in coupled reactions.

Biological oxidation-reduction reactions - introduction, redox potentials, relation between standard reduction potentials and free enegy change (dervations and numericals included). High-energy phosphate compounds - introduction, phosphate ^{32} P, ^{35} S, 14 C and 3H group transfers-free energy of hydrolysis of ATP and sugar phosphates along with reasons for high G.

UNIT-II Hydrodynamic Methods

Sedimentation - sedimentation velocity, preparative and analytical ultracentrifugation techniques. determination of molecular weight by hydrodynamic methods (derivations excluded and numericals included).

Measurement of pH

Principles of glass and reference electrodes, types of electrodes, complications of pH measurement (dependence of pH on ionic strength, electrode contamination and sodium error) and use of pH paper.

UNIT-III Radioisotopic Techniques

Types of radioisotopes used in Biochemistry, units of radioactivity measurements, techniques used to measure radioactivity (gas ionization and liquid scintillation counting), nuclear emulsions used in biological studies (pre-mounted, liquid and stripping), isotopes commonly used in biochemical studies-Autoradiography. Biological hazards of radiation and safety measures in handling radioisotopes. Biological application.

UNIT-IV Chromatography

General principles and applications of :

1. Adsorption chromatography
2. Ion-exchange chromatography
3. Thin-layer chromatography
4. Molecular-sieve chromatography
5. Hydrophobic chromatography
6. Gas-liquid chromatography
7. HPLC
8. Affinity chromatography
9. Paper chromatography

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

Electrophoresis

Basic principles of agarose electrophoresis, PAGE and SDS-PAGE, Two-dimensional electrophoresis, its importance. Isoelectrofocussing.

UNIT-V Spectroscopic Techniques

Beer-Lambert law, light absorption and its transmittance, determination and application of extinction coefficient, application of visible and UV spectroscopic techniques (structure elucidation and numericals excluded). Principle and application of NMR, ESR, Mass spectroscopy. Fluorescent and emission spectroscopy.

Immunological Techniques

Immunodiffusion, immunoelectrophoresis, radioimmunoassay, ELISA, immunofluores-cence.

PRACTICAL M.M. 50

1. Preparation of standard buffers and determination of pH of a solution.
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats.
4. Extimation of ascorbic acid.
5. Titration curve for amino acids and determination of pK value;
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   i) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    i) Estimations of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

24.7.2017 24.7.17 24.7.17 24/7/17 24.7.17

Syllabus of Biotechnology

(B. Sc. I Year)

Session

2019-2020
2020-2021

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

B.Sc.-I

BIOTECHNOLOGY

PAPER – I

BIOCHEMISTRY, BIOSTASTICS AND COMPUTERS

UNIT-I

1. Introduction to Biochemistry: History, Scope and Development.
2. Carbohydrates: Classification, Structure and Function of Mono, Oligo and Polysaccharides.
3. Lipids: Structure, Classification and Function.

UNIT –II

1. Amino acids and Proteins: Classification, Structure and Properties of amino acids, Types of Proteins and their Classification and Function.
2. Enzymes: Nomenclature and Classification of enzyme, Mechanism of enzyme action, Enzyme Kinetics and Factors affecting the enzymes action. Immobilization of enzyme and their application.

UNIT –III

1. Hormones: Plant Hormone-Auxin and Gibberellins and Animal Hormone-Pancreas and Thyroid.
2. Carbohydrates, Proteins and Lipid Metabolism - Glycolysis, Glycogenesis, Glyconeogenesis, Glycogenolysis and Krebs cycle. Electron Transport Chain and β-oxidation of Fatty acids.

UNIT-IV

1. Scope of Biostatistics, Samples and Population concept, Collection of data-sampling techniques, Processing and Presentation of data.
2. Measures of Central Tendency: Mean, Median and Mode and Standard Deviation.
3. Probability Calculation: Definition of probability, Theorem on total and compound probability.

UNIT-V

1. Computers - General introduction, Organization of computer, Digital and Analogue Computers and Computer Algorithm.
2. Concept of Hardware and Software, Input and Output Devices.
3. Application of computer in co-ordination of solute concentration, pH and Temperature etc., of a Fermenter in operation and Internet application.

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. Nelson and Cox (2005) Principles of Biochemistry, Fourth Edition
2. Todd and Howards Mason (2004) Text book of Biochemistry, Fourth Edition
3. Lubert Stryer and Berg ((2004) Biochemistry, Fifth Edition
4. Diana Rain, Marni Ayers Barby - (2006) Textbook on Q level Programming. 4th Edition.
5. Karl Schwartz: (2006) Guide of Micro Soft. Marina Raod, 4th Edition.
6. E Balaguruswamy by Programming in BASIC (1991).
7. RC Campbell by Statistics for Biologists. .
8. P Cassel et al by Inside Microsoft Office,
9. Statistical Methods, GW Snedecor and WG Cochran.
10. AC Wardlaw by Practical Statistics for Experimental Biologists,
11. JHZar by Bio-statistical analysis
12. RR Sokal FJ Rohlf by Introduction to Biostatistics
13. L Y Kun (2003) Microbial Biotechnology: Principles and applications
14. Khan and Khanum (1994) Fundamental of Biostastics

B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

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UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

List of Books

1. C.B. Power- Cell biology, First Edition (2005), Himalaya Publishing House.
2. Gereld Karp - Dell and molecular biology, 4th Edition (2005)
3. P.K. Gupta - Cell and molecular biology, Second Edition (2003), Restogi publications.
4. C.B., Oowar - Cell biology, Third Edition (2005) Himalaya Publishing Hosue.
5. S.S. Purohit - Microbiology : Fundamentals and Applications, 6th Edition (2004)
6. R.C. Dubey and D.K. Maheshwari: Practical Microbiology. S.Chand Publication.
7. R.C. Dubey and D.K. Maheshwari,Microbiology (2006). S.Chand Publication.
8. Tortora, Funke and Case - Microbiology, An introduction, sixth Edition (1995), Benjamin/Cummings Publishing Company.
9. Prescott, Harlyey and Klein - Microbiology, Third Edition, Wm. C. Brown Publishers (1996).
10. P. Chakraoborthy - Textbook of microbiology, Second Edition (2007).
11. Prescott, Harley and Klein - Microbiology. Third Edition. Wm. C. Brown.
12. Microbial Genetics, David Freifelder, John F Cronan, Stanley R Maloy, Jones and Bartlett Publishers.
13. Elements of Human Genetics. I.I. cavalla-Sfoeza, WA Benjamin Advanced Book Program.
14. S.K Jadhav and P.K. Mahish (2018) Prayogtmak Jaivprodyogiki awam Sukshmjivigyan- Chhattisgarh Hindi Granth Academy, Raipur.

List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

10.6.19 10.6.19 10/6/19 10.6.19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 2960/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–दो के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

———00———

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–दो के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2020–21 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी.– आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) – आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।

उपरोक्त विषयों को शिक्षा सत्र 2020–21 से संशोधित रूप में स्नातक स्तर भाग–दो के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 में लागू पाठ्यकम मान्य होंगे एवं भाग – तीन के पाठ्यक्रम यथावत रहेंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय के परीक्षा विभाग एवं वेबसाईट पर प्रकाशित करने हेतु वेबसाईट प्रभारी को उपलब्ध करा दी गई है।

कुलसचिव

क्र. 2961/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 परिपेक्ष्य में सूचनार्थ।
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-Ii examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the thirdyear.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-Iexamination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIexamination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIIexamination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department orCollege.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

      1. Physics, Chemistry &Mathematics.
      2. Chemistry, Botany &Zoology.
      3. Chemistry, Physics &Geology.
      4. Chemistry, Botany &Geology.
      5. Chemistry, Zoology &Geology.
      6. Geology, Physics &Mathematics.
      7. Chemistry, Mathematics &Geology.
      8. Chemistry, Botany & DefenceStudies.
      9. Chemistry, Zoology & DefenceStudies
      10. Physics, Mathematics & DefenceStudies.
      11. Chemistry, Geology & DefenceStudies

12. Physics, Mathematics &Statistics
13. Physics, Chemistry &Statistics
14. Chemistry, Mathematics &Statistics.
15. Chemistry, Zoology &Anthropology.
16. Chemistry, Botany &Anthropology.
17. Chemistry, Geology &Anthropology.
18. Chemistry, Mathematics &Statistics.
19. Chemistry, Anthropology & DefenceStudies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defence Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & AppliedStatistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & ComputerApplication
27. Chemistry, Mathematics & ComputerApplication
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & EnvironmentalBiology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry,Botany
38. Chemistry, Biochemistry,Zoology
39. Chemistry, Biochemistry,Microbiology
40. Chemistry, Biotechnology,Botany
41. Chemistry, Biotechnology,Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for coresubjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to thateffect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examinationseparately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementaryexamination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the ThirdDivision.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Total Marks	Min. Marks
C	Environmental Studies		75	100	33
	Fild Work		25		
Foundation Course					
	Hindi Language		75	75	26
	English Language		75	75	26

नोटः– प्रत्येक में से 02 (दो) प्रश्न करने होगें । सभी प्रश्न समान अंक के होगें।

Three Elective Subject :

1.	Physics	I	50	100	33
		II	50		
		Practical		50	17
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50	100	33
		II	50		
		Practical		50	17
5.	Zoology	I	50	100	33
		II	50		
		Practical		50	17
6.	Geology	I	50	100	33
		II	50		
		Practical	50		17
7.	Statistics	I	50	100	33
		II	50		
		Practical		50	17
8.	Anthropology	I	50	100	50
		II	50		
		Practical		50	17

Subject	Paper	Max. Marks	Total Marks	Min. Marks
CompulsorySubject–FoundationCourse:				
9. DefenseStudies	I	50	100	33
	II	50		
	Practical		50	17
10. MicroBiology	I	50	100	33
	II	50		
	Practical		50	17
11. ComputerSciences	I	50	100	33
	II	50		
	Practical		50	17
12. Information Technology	I	50	100	33
	II	50		
	Practical		50	17
13.IndustrialChemistry	I	34		
	II	33	100	33
	III	33		
	Practical		50	17
14. BioChemistry	I	50		
	II	50	100	33
15.BioTechnology	Practical	50	50	17
	I			
	II	50	100	33
	Practical		50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memoty and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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संशोधित पाठ्यक्रम
बी.ए./बी.एस–सी./बी.कॉम./बी.एच.एस.–सी.
भाग – दो, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा) (पेपर कोड – 0171) **पूर्णांक– 75**

खण्ड – क निम्नलिखित 5 लेखकों के पाठ शामिल होंगे – **अंक–35**

1. महात्मा गांधी	–	चोरी और प्रायश्चित
2. आचार्य नरेंद्र देव	–	युवकों का समाज में स्थान
3. वासुदेव शरण अग्रवाल	–	मातृभूमि
4. हरि ठाकुर	–	डॉ. खूबचंद बघेल
5. पं. माधवराव सप्रे	–	सम्भाषण–कुशलता

खण्ड–ख हिन्दी भाषा और उसके विविध रूप **अंक–16**

1. कार्यालयीन भाषा
2. मीडिया की भाषा
3. वित्त एवं वाणिज्य की भाषा
4. मशीनी भाषा

खण्ड–ग हिन्दी की व्याकरणिक कोटियॉ **अंक–24**

संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण,
समास, संधि एवं संक्षिप्तियां
अनुवाद व्यवहार : अंग्रेजी से हिन्दी में अनुवाद

इकाई विभाजन–

इकाई– 1 चोरी और प्रायश्चित : महात्मा गांधी / कार्यालयीन भाषा, मीडिया की भाषा

इकाई– 2 युवकों का समाज में स्थान : आचार्य नरेन्द्र देव / वित एवं वाणिज्य की भाषा, मशीनी भाषा

इकाई– 3 मातृभूमिः वासुदेवशरण अग्रवाल / संज्ञा सर्वनाम, विशेषण, क्रिया विशेषण

इकाई– 4 डॉ. खूबचंद बघेल : हरि ठाकुर/समास, संधि,

इकाई– 5 सम्भाषण–कुशलता : पं. माधवराव सप्रे, / अनुवाद – अंग्रेजी से हिन्दी में अनुवाद, संक्षिप्तियॉ

मूल्यांकन योजना –

प्रत्येक इकाई से एक–एक प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई को दो–दो खण्डों (क्रमश' 'क' और 'ख' में) विभक्त करते हुए निर्धारित पाठ से 8 एवं शेष पाठ्य सामग्री से 7 अंक के प्रश्न होंगे। इस प्रकार पूरे प्रश्न–पत्र के पूर्णांक 75 होंगे।

पाठ्यक्रम संशोधन का औचित्य : विद्यार्थी चर्चित एवं सुप्रसिद्ध व्यक्तियों के लेख के माध्यम से समाज एवं राष्ट्रहित के साथ–साथ व्यक्तित्व विकास विषयक मुद्दों से परिचित हो सके तथा व्याकरिणक एवं भाषा विषयक प्रस्तावित पाठ्यक्रम के माध्यम से हिन्दी भाषा संबंधित प्रयोग पक्ष से परिचित होते हुए प्रतियोगी परीक्षाओं की दृष्टि से ज्ञानार्जन कर सके।

ENGLISH LANGUAGE (Paper Code-1132)

B.A. / B.Sc. /B.COM. /B.H. Sc. - II

M.M.75

The question paper for B.A. /B.Sc./B.Com./B.H.Sc., English Language and cultural valuers shall comprise the following units:

UNIT-I Short answer questions to be passed by (Five short answer questions of three marks each) 15 Marks

UNIT-II (a) Reading comprehension of an unseen passage 05 Marks

(b) Vocabulary

UNIT-III Report-Writing 10 Marks

UNIT-IV Expansion of an idea 10 Marks

UNIT-V Grammar and Vocabulary based on the prescribed text book. 20+15Marks

Note: Question on all the units shall asked from the prescribed text which will Comprise Specimens of popular creative/writing and the following it any

a Matter & technology

i. State of matter and its structure

ii. Technology (Electronics Communication, Space Science)

b Our Scientists & Institutions

I. Life & work of our eminent scientist Arya Bhatt. Kaurd Charak Shusruta, Nagarjuna, J.C. Bose and C.V. Raman, S. Rmanujam, Homi J. Babha Birbal Sahani.

II. Indian Scientific Institutions (Ancient & Modern)

Books Prescribed:

Foundation English for U.G. Second Year - Published by M.P. Hindi Granth Academy, Bhopal.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

NEW CURRICULUM OF B.Sc. PART II

SESSION 2019-20

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I

INORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz*., atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. OXIDATION AND REDUCTION: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from uranium, similarities between the latter actinides and the latter lanthanides

UNIT-V

A. ACIDS BASES : Arrhenius, Bronsted-Lowry, conjugate acids and bases, relative strengths of acids and bases, the Lux-flood, Solvent system and Lewis concepts of acids and bases.

B. NON-AQUEOUS SOLVENTS

.Physical properties of a solvent, types of solvents and their general characteristics, reaction in non-aqueous solvents with reference to liquid ammonia and liquid sulphur dioxide, HF, H_2SO_4 , Ionic liquids.

REFERENCE BOOKS

1. Basic Inorganic Chemistry, F. A. Cotton, G. Wilkinson and P. L. Gaus, Wiley
2. Concise Inorganic Chemistry, J. D. Lee, ELBS
3. Concepts of Models of Inorganic Chemistry, B. Douglas, D. Mc Daniel and J. Alexander, John Wiley.
4. Inorganic Chemistry, D. E. Shriver, P. W. Atkins and C. H. Langford, Oxford.
5. Inorganic Chemistry, W. W. Porterfield, Addison – Wiley.
6. Inorganic Chemistry, A. G. Sharp, ELBS.
7. Inorganic Chemistry, G. L. Miessler and D. A. Tarr, Prentice Hall.
8. Advanced Inorganic Chemistry, Satya Prakash.
9. Advanced Inorganic Chemistry, Agarwal and Agarwal
10. Advanced Inorganic Chemistry, Puri, Sharma, S. Naginchand
11. Inorganic Chemistry, Madan, S. Chand
12. Aadhunik Akarbanic Rasayan, A. K. Shrivastav & P. C. Jain, Goel Pub
13. Uchchattar Akarbanic Rasayan, satya Prakash & G. D. Tuli, Shyamal Prakashan
14. Uchchattar Akarbanic Rasayan, Puri & Sharma
15. Selected topic in Inorganic Chemistry by Madan Malik & Tuli, S. Chand.

Paper – II

ORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF ORGANIC HALIDES

Alkyl halides: Methods of preparation, nucleophilic substitution reactions – S_N1, S_N2 and S_N^i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution, elimination reactions.

Aryl halides: Preparation, including preparation from diazonium salts, Nucleophilic Aromatic Substitution; SNAr, Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

UNIT-II

ALCOHOLS

A. Alcohols: Nomenclature, preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt-Blanc Reduction for the preparation of alcohols, Dihydric alcohols – methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement.

B. Trihydric alcohols - Nomenclature, methods of formation, chemical reactions of glycerol.

PHENOLS

A. Structure and bonding in phenols, physical properties and acidic character, Comparative acidic strength of alcohols and phenols, acylation and carboxylation.

B. Mechanism of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesh reaction, Lederer-Manasse reaction and Reimer-Tiemann reaction.

UNIT-III

ALDEHYDES AND KETONES

A. Nomenclature, structure and reactivity of carbonyl group. General methods of preparation of aldehydes and ketones.

Mechanism of nucleophilic addition to carbonyl groups: Benzoin, Aldol, Perkin and Knoevenagel condensation. Condensation with ammonia and its derivatives, Wittig reaction, Mannich reaction, Beckmann and Benzil- Benzilic rearrangement.

B. Use of acetate as protecting group, Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen reduction, Wolf-Kishner reaction, $LiAlH_4$ and $NaBH_4$ reduction. Halogenation of enolizable ketones, An introduction to α,β-unsaturated aldehydes and ketones.

24.6.2013 24.6.13

UNIT-IV

A. CARBOXYLIC ACIDS

Preparation, Structure and bonding, Physical and chemical properties including, acidity of carboxylic acids, effects of substituents on acid strength, Hell-Volhard Zeilinsky reaction. Reduction of carboxylic groups, Mechanism of decarboxylation.

Di carboxylic acids: Methods of formation and effect of heat and dehydrating agents, Hydroxyacids.

B. CARBOXYLIC ACID DERIVATIVES

Structure of acid chlorides, esters, amides and acid anhydrides, Relative stability of acyl derivatives.

Physical properties, inter-conversion of acid derivatives by nucleophilic acyl substitution.

Mechanism of acid and base catalyzed esterification and hydrolysis.

UNIT-V

ORGANIC COMPOUNDS OF NITROGEN

A. Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanism of nucleophilic substitution in nitroarenes and their reduction in acidic, neutral and alkaline medium.

B. Reactivity, structure and nomenclature of amines, physical properties. Stereochemistry of amines. Separation of mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds and nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-Phthalimide reaction, Hofmann-Bromamide reaction, Reactions of amines, electrophilic aromatic substitution of aryl amines, Reaction of amines with nitrous acid. Synthetic transformations of aryl diazonium salts, Azo coupling.

REFERENCE BOOKS

1. Organic Chemistry, Morrison and Boyd, Prentice-Hall.
2. Organic Chemistry, L. G. Wade Jr. Prentice Hall.
3. Fundamentals of Organic Chemistry, Solomons, John Wiley.
4. Organic Chemistry, Vol I, II, III S. M. Mukherjee, S. P. Singh and R. P. Kapoor, Wiley Easters (New Age).
5. Organic Chemistry, F. A. Carey, McGraw Hill.
6. Introduction to Organic Chemistry, Struiweisser, Heathcock and Kosover, Macmillan.
7. Organic Chemistry, P. L. Soni.
8. Organic Chemistry, Bahl and Bahl.
9. Organic Chemistry, Joginder Singh.
10. Carbanic Rasayan, Bahl and Bahl.
11. Carbanic Rasayan, R. N. Singh, S. M. I. Gupta, M. M. Bakidia & S. K. Wadhwa.
12. Carbanic Rasayan, Joginder Singh.

Paper – III
PHYSICAL CHEMISTRY **60 Hrs., Max Marks 34**

UNIT-I

A. THERMODYNAMICS-I

Intensive and extensive variables; state and path functions; isolated, closed and open systems; Zeroth law of thermodynamics. First law: Concept of heat, work, internal energy and statement of first law; enthalpy, Relation between heat capacities, calculations of q, w, U and H for reversible, irreversible and free expansion of gases under isothermal and adiabatic conditions. Joule-Thomson expansion, inversion temperature of gases, expansion of ideal gases under isothermal and adiabatic condition

B. THERMO CHEMISTRY

Thermochemistry, Laws of Thermochemistry, Heats of reactions, standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions, Adiabatic flame temperature, explosion temperature.

UNIT-II

A. THERMODYNAMICS-II

Second Law of Thermodynamics: Spontaneous process, Second law, Statement of Carnot cycle and efficiency of heat engine, Carnot's theorem, thermodynamic state of temperature.

Concept of entropy: Entropy change in a reversible and irreversible process, entropy change in isothermal reversible expansion of an ideal gas, entropy change in isothermal mixing of ideal gases, physical signification of entropy, Molecular and statistical interpretation of entropy.

B. Gibbs and Helmholtz free energy, variation of G and A with pressure, volume, temperature, Gibbs-Helmholtz equation, Maxwell relations, Elementary idea of Third law of Thermodynamics, concept of residual entropy, calculation of absolute entropy of molecule.

UNIT III

A CHEMICAL EQUILIBRIUM

Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases. Concept of Fugacity, Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient. Coupling of exergonic and endergonic reactions. Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Thermodynamic derivation of relations between the various equilibrium constants Kp, Kc and Kx. Le Chatelier principle (quantitative treatment). Equilibrium between ideal gas and a pure condensed phase.

B IONIC EQUILIBRIA

Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono protic acids (exact treatment). Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

UNIT-IV

PHASE EQUILIBRIUM

A. Phase rule, Phase, component and degree of freedom, derivation of Gibbs phase rule, Clausius-Claperon equation and its applications to Solid-Liquid, Liquid-Vapor and Solid-Vapor, limitation of phase rule, applications of phase rule to one component system: Water system and sulphur system.

Application of phase rule to two component system: Pb-Ag system, desilverization of lead, Zn-Mg system, Ferric chloride-water system, congruent and incongruent melting point and eutectic point.

Three component system: Solid solution liquid pairs.

B. Nernst distribution law, Henry's law, application, solvent extraction

UNIT V

PHOTOCHEMISTRY

Characteristics of electromagnetic radiation, Interaction of radiation with matter, difference between thermal and photochemical processes, Lambert-Beer's law and its limitations, physical significance of absorption coefficients. Laws of photochemistry: Grothus-Drapper law, Stark-Einstein law, quantum yield, actinometry, examples of low and high quantum yields, Photochemical equilibrium and the differential rate of photochemical reactions, Quenching, Role of photochemical reaction in biochemical process.

Jablonski diagram depicting various process occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), photosensitized reactions, energy transfer processes {simple examples), photostationary states, Chemiluminescence.

REFERENCE BOOKS

1. Physical Chemistry, G. M. Barrow, International student edition, McGraw Hill.
2. University General Chemistry, C. N. R. Rao, Macmillan.
3. Physical Chemistry, R. A. Alberty, Wiley Eastern.
4. The elements of physical chemistry, Wiley Eastern.
5. Physical Chemistry through problems, S. K. Dogra & S. Dogra, Wiley Eastern.
6. Physical Chemistry, B. D. Khosla,.
7. Physical Chemistry, Puri & Sharma.
8. Bhautik Rasayan, Puri, Sharma and Pathania, Vishal Publishing Company.
9. Bhautik Rasayan, P. L. Soni.
10. Bhautik Rasayan, Bahl and Tuli.
11. Physical Chemistry, R. L. Kapoor, Vol I-IV **.**
12. Chemical kinetics, K. J. Laidler, Pearson Educations, New Delhi (2004).

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

PHYSICAL CHEMISTRY

Transition Temperature

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:
  (i) $I_2(aq) + I \rightarrow I_3(aq)^{2+}$
  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt.

6 marks

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations.

12 marks

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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Session 2019-20

PHYSICS

B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

Transition to quantum statistics: 'h' as a natural constant and its implications, cases of particle in a one-dimensional box and one-dimensional harmonic oscillator.

Unit-5 Indistinguishability of particles and its consequences, Bose-Einstein & Fermi-Dirac conditions, Concept of partition function, Derivation of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics, Limits of B-E and F-D statistics to M-B statistics. Application of B-E statistics to black body radiation, Application of F-D statistics to free electrons in a metal.

TEXT AND REFERENCE BOOKS:

1. B.B. Laud, "Introduction to Statistical Mechanics" (Mcmillan 1981)
2. F. Reif : "Statistical Physics" (Mcgraw-Hill, 1998).
3. K, Haung : "Statatistical Physics" (Wiley Eastern, 1988).
4. Thermal and statistical Physics: R.K. Singh, Y.M. Gupta and S. Sivraman.
5. Statistical Physics: Berkeley Physics Course, Vol. 5
6. Physics (Part-2): Editor, Prof. B.P. Chandra, M.P. Hindi Granth Academy.
7. Heat and Thermodynamics: K.W. Zeemansky.
8. Thermal Physics: B.K. Agarwal.
9. Heat and Thermodynamics: Brij Lal and N. Subramanyam.
10. Heat and Thermodynamics: Dayal, Verma and Pandey.
11. A Treatise on Heat: M.N. Saha and B.N. Srivastava.

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Session 2019-20

PHYSICS

Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications, its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser, and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Session 2019-20

PHYSICS

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.Sc. Part-II
Paper-I
ADVANCED CALCULUS

UNIT-I Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion. Series of non-negative terms. Comparison tests, Cauchy's integral test, Ratio tests, Raabe's, Logarithmic, De Morgan and Bertrand's tests. Alternating series, Leibnitz's theorem. Absolute and conditional convergence.

UNIT-II Continuity, Sequential continuity, Properties of continuous functions, Uniform continuity, Chain rule of differentiability, Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives, Taylor's theorem with various forms of remainders.

UNIT-III Limit and continuity of functions of two variables. Partial differentiation. Change of variables. Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables. Jacobians.

UNIT-IV Envelopes, evolutes. Maxima, minima and saddle points of functions of two variables. Lagrange's multiplier method.

UNIT-V Beta and Gamma functions, Double and triple integrals, Dirichlet's integrals, Change of order of integration in double integrals.

REFERENCES :

1. Gabriel Klaumber, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. R.R. Goldberg, Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970.
4. D. Soma Sundaram and B. Choudhary, A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
6. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
7. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York.
8. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
9. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
10. O.E. Stanaitis, An Introduction to Sequences, Series and Improper Integrals, Holden-Dey, Inc., San Francisco, California.
11. Earl D. Rainville, Infinite Series, The Macmillan Company, New York.
12. Chandrika Prasad, Text Book on Algebra and Theory of Equations, Pothishala Pvt. Ltd., Allahabad.
13. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
14. Shanti Narayan, A Course of Mathematical Analysis, S.Chand and Company, New Delhi.

B.Sc. Part-II
Paper-II
DIFFERENTIAL EQUATIONS

UNIT-I Series solutions of differential equations- Power series method, Bessel and Legendre functions and their properties-convergence, recurrence and generating relations, Orthogonality of functions, Sturm-Liouville problem, Orthogonality of eigen-functions, Reality of eigen values, Orthogonality of Bessel functions and Legendre polynomials.

UNIT-II Laplace Transformation- Linearity of the Laplace transformation, Existence theorem for Laplace transforms, Laplace transforms of derivatives and integrals, Shifting theorems. Differentiation and integration of transforms. Convolution theorem. Solution of integral equations and systems of differential equations using the Laplace transformation.

UNIT-III Partial differential equations of the first order. Lagrange's solution, Some special types of equations which can be solved easily by methods other than the general method, Charpit's general method of solution.

UNIT-IV Partial differential equations of second and higher orders, Classification of linear partial differential equations of second order, Homogeneous and non-homogeneous equations with constant coefficients, Partial differential equations reducible to equations with constant coefficients, Monge's methods.

UNIT-V Calculus of Variations- Variational problems with fixed boundaries- Euler's equation for functionals containing first order derivative and one independent variable, Extemals, Functionals dependent on higher order derivatives, Functionals dependent on more than one independent variable, Variational problems in parametric form, invariance of Euler's equation under coordinates transformation.

Variational Problems with Moving Boundaries- Functionals dependent on one and two functions, One sided variations.

Sufficient conditions for an Extremum- Jacobi and Legendre conditions, Second Variation. Variational principle of least action.

REFERENCES :

1. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999.
2. D.A. Murray, Introductory Course on Differential Equations, Orient Longman, (India), 1967.
3. A.R. Forsyth, A Treatise on Differential Equations, Macmillan and Co. Ltd., London.
4. Lan N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill Book Company, 1988.
5. Francis B. Hilderbrand, Advanced Calculus for Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 1977.
6. Jane Cronin, Differential equations, Marcel Dekkar, 1994.
7. Frank Ayres, Theory and Problems of Differential Equations, McGraw-Hill Book Company, 1972.
8. Richard Bronson, Theory and Problems of Differential Equations, McGraw-Hill, Inc., 1973.
9. A.S. Gupta, Calculus of variations with-Applications, Prentice-Hall of India, 1997.
10. R. Courant and D. Hilbert, Methods of Mathematical Physics, Vots. I & II, Wiley-Interscience, 1953.
11. I.M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice-Hill, Englewood Cliffs (New Jersey), 1963.
12. A.M. Arthurs, Complementary Variational Principles, Clarendon Press, Oxford, 1970.
13. V. Kornkov, Variational Principles of Continuum Mechanics with Engineering Applications, Vol. I, Reidel Publ. : Dordrecht, Holland, 1985.
14. T. Oden and J.N. Reddy, Variational Methods in Theoretical Mechanics, Springer-Verlag, 1976.

B.Sc. Part-II
Paper-III
MECHANICS

STATICS

UNIT-I Analytical conditions of Equilibrium, Stable and unstable equilibrium. Virtual work, Catenary.

UNIT-II Forces in three dimensions, Poinsot's central axis, Null lines and planes.

DYNAMICS

UNIT-III Simple harmonic motion. Elastic strings. Velocities and accelerations along radial and transverse directions, Projectile, Central orbits.

UNIT-IV Kepler's laws of motion, velocities and acceleration in tangential and normal directions, motion on smooth and rough plane curves.

UNIT-V Motion in a resisting medium, motion of particles of varying mass, motion of a particle in three dimensions, acceleration in terms of different co-ordinate systems.

REFERENCES :

1. S.L. Loney, Statics, Macmillan and Company, London.
2. R.S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a particle and of rigid bodies, Cambridge University Press, 1956.

B.Sc.–II (BOTANY) PAPER-I

(PLANT TAXONOMY, ECONOMIC BOTANY, PLANT ANATOMY AND EMBRYOLOGY)

UNIT-I

Bentham and Hooker system of classification.Binomial Nomenclature, International Code of Nomenclature for Algae, Fungi, and plants (IUCN), Typification, numerical Taxonomy and chemotaxonomy. Preservation of Plant material and Herbarium techniques.Important botanical gardens and herbaria of India, Kew Botanical garden, England.

UNIT-II

Systematic position, distinguishing characters and economic importance of the following families, Ranunculaceae, Magnoliaceae, Brassicaeae, Rosaceae, Papaveraceae, Caryophyllaceae, Rutaceae, Cucurbitaceae, Apiaceae, Rubiaceae, Apocynaceae, Asclepiadaceae, Solanaceae, Malvaceae, Convolvulaceae, Orchidaceae, Acanthaceae, verbenaceae, Lamiaceae, Asteraceae, Fabaceae, Euphorbiaceae, Poaceae and Liliaceae.

UNIT-III

Economic Botany: Botanical name, family, part used and uses of the following economically important plants, fiber yielding plants; Cotton, jute, sun, hemp, coir.Timber yielding plants: Sal, Teak, Shisham and Pine.Medicinal plants: Kalmegh, Ashwangandha, Ghritkumari, Giloy, Brahmi, sarpgandha, ---of medicinal plants of C.G. Food plants: Pearl millet, Buck of wheat, Sorghum, Soyabean, gram, Ground nut, Sugarcane and Potato.Fruit plants: Pear, Peach, Litchi. Spices: Cinnamon, Turmeric, Ginger, Asafoetida and Cumin. Beverages : Tea, Coffee Rubber Cultivation of important flowers: Chrysanthemum, Dahelia, Biodiesel plants Jatropha, Pongamia Ethnobotany in context of Chhattisgarh.

UNIT-IV

Plant Anatomy: Root and shoot apical meristems theories of root and shoot apex organization, permanent tissues, anatomy of root, stem and leaf of dicot and monocot, secondary growth in root and stem, Anatomical anomalies in the primary structure of stems (Nyctanthes, Boerhaavia, Casuarina), Anamolous secondary growth in Dracaena, Bignonia, Laptadenia.

UNIT-V

Embryology: Flower as a reproductive organ, anther, microsporogenesis, types of ovules, megasporogenesis, development of male and female gametophyte, pollination, mechanisms, self incompatibility, fertilization, endosperm, embryo, polyembryonoy, apomixes and parthenocarpy.

Books Recommended:

13.6.19 13/6/19 13.6.19 13.6.19

Singh, Pandey,Jain. ***Diversity and Systematics of Seed Plants***, Rastogi Publications Merrut

Sharma OP, ***Plant Taxonomy,*** Tata Mc Graw Hill, New Delhi

Pandey BP, ***Taxonomy of Angiosperms,*** S. Chand Publishing, New Delhi

Pandey, BP, ***Plant Anatomy,*** S.Chand Publishing, New Delhi

Pandey, BP, ***Economic Botany,*** S.Chand Publishing, New Delhi

Bhojwani, SS and Bhatanagar SP, ***Embryology of Angiosperm***, Vikas Publication House, New Delhi

Singh, Pandey, Jain, ***Embryology of Angiosperms***, Rastogi Publication, Meerut

Sharma, V, Alum, A. ***Ethnobotany***, Rastogi Publications, Meerut

Tayal, MS ***Plant Anatomy***, Rastogi Publication, Meerut

(Dr. J.N. Verma) (Dr.Rekha Pimpalgaonkar) (Dr.Ranjana Shristava)

Proff. & Head Proff. & Head Proff. & Head

Govt. D.B. Girls PG College Govt. N PG Science College Govt. VYTPG Science College

Raipur, (C.G.) Raipur, (C.G.) Raipur, (C.G.)

(Mrs. Sanchal Moghe) (Mr. Shivakant Mishra) (Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

13.6.19 13/6/19 13:6.19 13.6.19

B.Sc.-II (BOTANY) PAPER-II

(ECOLOGY AND PLANT PHYSIOLOGY)

UNIT-I

Introduction and scope of ecology, environmental and ecological factors, Soil formation and soil profile, Liebig's law of minimum, Shelford's law of tolerance, morphological and anatomical adapataions in hydrophytes, xerophytes and epiphytes.

UNIT-II

Population and community characteristics, Raunkiaer's life forms, population interactions (e.g. Symbiosis, Amensalism etc.), succession, ecotone and edge effect, ecological niches, ecotypes, ecads, keystone species

Concept of ecosystem, trophic levels, flow of energy in ecosystem, food chain and food web, concept of ecological pyramids

Biogeochemical cycles:carbon cycle, nitrogen cycle and phosphorus cycle

UNIT-III

Plant water relations: Diffusion, permeability, osmosis, imbibitions, plasmolysis, osmotic potential and water potential, Types of soil water, water holding capacity, wilting, Absorption of water, theories of Ascent of sap, Mineral nutrition and absorption, Deficiency symptoms, Transpiration, stomatal movement, significance of transpiration, Factors affecting transpiration, guttation.

UNIT-IV

Photosynthesis: Photosynthetic apparatus and pigments, light reaction mechanism of ATP synthesis. C3, C4 CAM pathway of carbon reduction, photorespiration, factors affecting photosynthesis.

Respiration: Aerobic and anaerobic respiration, Glycolysis, Kreb's cycle, factors affecting respiration, R.Q.

UNIT-V

Plant growth hormones: Auxin, Gibberellin, Cytokinin, Ethylene and Abscissic acid. Physiology of flowering, Florigen concept, Photoperiodism and Vernalization. Seed dormancy and germination, plant movement.

Books Recommended:

Koromondy, EJ. ***Concepts of Ecology,*** Prentice Hall, USA

13.6.19 13/6/19 13.6.19 13.6.19

Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

13.6.19

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13.6.19

13.6.19

Hemchand Yadav Vishwavidyala, Durg (C.G.)
Zoology
B.Sc. Part – II (2019-20)
Paper – I
(Anatomy and Physiology)

Comparative Anatomy of various organ systems of vertebrates:

Unit: I

- Integument and its derivatives: structure of scales, hair and feathers
- Alimentary canal and digestive glands in vertebrates
- Respiratory organs : Gills and lung , air-sac in birds

Unit: II

- Endoskeleton: (a) Axial Skeleton- Skull and Vertebrae, (b) Appendicular Skeleton Limbs and girdles
- Circulatory System: Evolution of heart and aortic arches
- Urinogenital System: Kidney and excretory ducts

Unit: III

- Nervous System: General plan of brain and spinal cord
- Ear and Eye: structure and function
- Gonads and genital ducts

Unit: IV

- Digestion and absorption of dietary components
- Physiology of heart, cardiac cycle and ECG
- Blood Coagulation
- Respiration: mechanism and control of breathing

Unit: V

- Excretion: Physiology of excretion, osmoregulation
- Physiology of muscle contraction
- Physiology of nerve impulse, Synaptic transmission

14.6.19

14.06.19

14.6.19.

Zoology
B.Sc. Part – II (2019-20)

Paper-II

VERTEBRATE ENDOCRINOLOGY, REPRODUCTIVE BIOLOGY BEHAVIOUR, EVOLUTION AND APPLIED ZOOLOGY

Unit: I

- Structure and function of Endocrine glands
- Hormone receptor
- Biosynthesis and secretion of thyroid, adrenal, ovarian and testicular hormones
- Endocrine disorder of pituitary, thyroid, adrenal and pancreas

Unit:II

- Reproductive cycle in vertebrates
- Menstruation, lactation and pregnancy
- Mechanism of parturition
- Hormonal regulation of gametogenesis

Unit: III

- Evidences of organic evolution.
- Theories of organic evolution.
- Variation, Mutation, Isolation and Natural selection.
- Evolution of Horse

Unit:IV

- Introduction to Ethology: Branches and concept of ethology.
- Patterns of Behaviour, Taxes, Reflexes, Drives and Stereotyped behaviour.
- Reproductive behavioural patterns.
- Drugs and behavior, Hormones and behaviour

Unit:V

- Prawn Culture
- Sericulture
- Apiculture
- Pisciculture
- Poultry keeping
- Elements of Pest Control: Chemical & Biological Control

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Zoology
B.Sc. Part II (2019-20)
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

14.6.19 14.06.19 14.6.19.

MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Paper- II: Bioinstrumentation and Biostatistics

UNIT-1: MICROSCOPY AND CENTRIFUGATION

Simple and compound light microscope, Bright field, Dark field, Phase contrast and Electron microscope. Centrifugation- principle and types of centrifuges (analytical and preparatory), types of centrifugation- differential and rate zonal centrifugation.

UNIT-2: pH metry and chromatography

Principle of pH meter, types of electrodes, factors affecting pH measurements, and application of pH meter. Chromatography- principle, types- paper, TLC and column chromatography, HPLC.

UNIT-3: SPECTROPHOTOMETRY

Electromagnetic spectrum, Beers-Lamberts law, Types (Principles, working and application)- colorimeter, UV - Vis Spectrophotometry and IR- Spectrophotometry, Turbidometry.

UNIT-4: Electrophoresis and X-Ray Diffraction

Principle of electrophoresis, instrumentation and Application, types of Paper, Gel electrophoresis and Immunoelectrophoresis. X-ray diffraction- principle and application.

UNIT-5: Biostatistics

Data- Types, characteristics, presentation and distribution. Data analysis- central tendency (Mean, Median and Mode), Deviation (variance SD and SE). Concept of probability.

Text Books Recommended:

1. Introduction to Istrumental analysis by Robert Braun.
2. Instrumental Techniques by Upadhyay and Upadhyay.
3. Instrumental Methods of Chemical Analysis by BK Sharma.
4. Bio statistics; Sunder Rao
5. Statistical Methods; S. P. Gupta; Sultan Chand & Sons

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PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

15/6/19 18/6/19 15/6/19 15/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

22-5-19 22/5/19

कक्षा / Class- B.Sc-II

Paper –I

शैलिकी

(PETROLOGY)

इकाई–01

(i) मैग्मा; परिभाषा, उत्पत्ति एवं संगठन

(ii) बॉवेन की अभिक्रिया श्रेणी, मैग्मीय विभेदन एवं स्वांगीकरण

(iii) तंत्र, प्रावस्था एवं घटक, उष्मागतिकी के सिद्धांत, एकघटकीय (सिलिका) द्विघटकीय ऐल्बाईट–एनॉर्थाइट तथा डायोप्साइड–एनॉर्थाइट एवं त्रिघटकीय सिलिकेट सिस्टम डायोप्साइड–एल्बाइट–एनॉर्थाइट क्रिस्टलीकरण, प्रावस्था संतुलन

(iv) आग्नेय शैलों का गठन, संरचनायें एवं वर्गीकरण

(v) आग्नेय शैलों का रूप

इकाई–02

(i) दिक्काल में शैल–संलग्नता, शैल–ग्रंथियों की अवधारणा

(ii) अम्लीय आग्नेय शैलों का शिला विवरणात्मक अध्ययन

(iii) क्षारीय आग्नेय शैलों का शिला–विवरणात्मक अध्ययन

(iv) अल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

(v) अत्यल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

इकाई–03

(i) अवसाद की उत्पत्ति, परिवहन एवं निक्षेपण

(ii) अवसाद निक्षेपण की वायूढ़, जलोढ़, तटीय, एवं गंभीर समुद्री वातावरण की गतिकी

(iii) अवसादी संलक्षणाओं की अवधारणा

(iv) डायजिनेसिस की अवधारणा

(v) अवसादी शैलों का गठन एवं संरचनायें

इकाई–04

(i) अवसादी शैलों का वर्गीकरण

(ii) अवसादी शैलों की शैलिकी : रूडेशियस, एरेनेशियस, केल्केरियस अवसादी शैल

(iii) कायान्तरणः परिभाषा एवं कारक, संलक्षणा, कायान्तरण श्रेणी

(iv) कायान्तरित शैलों का गठन, संरचना एवं वर्गीकरण

(v) कायान्तरण प्रक्रियाओं की साम्य एवं असाम्य अभिक्रियायें

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इकाई–05 (i) पैराजिनेटिक–आरेखः प्रक्षेपीय विश्लेषण, ए.सी.एफ. एवं ए.के.एफ. आरेख

(ii) मृण्मय अवसादों का प्रगामी कायान्तरण

(iii) अशुद्ध चूना पत्थरों का प्रगामी–उष्मागतिक कायान्तरण

(iv) अल्प सिलिक शैलों का प्रगामी उष्मागतिक कायान्तरण

(v) भारत का शैलिकीय–प्रादेशिक विभाजन

प्रायोगिक कार्य–

(1) आग्नेय, अवसादी एवं कायान्तरित शैलों के विभिन्न रूपों एवं संरचनाओं को रेखाचित्र की सहायता से प्रदर्शित करना।

(2) विभिन्न आग्नेय शैलों का स्थूलदर्शी अध्ययन एवं सूक्ष्मदर्शी अध्ययन

(3) विभिन्न अवसादी शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(4) विभिन्न कायान्तरित शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(5) भारत के शैलिकीय प्रदेशों का मानचित्र में प्रदर्शन

(6) नार्म कैलकुलेशन

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S. Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary Environment - H.G. Readings

Class- B. Sc. -II

Paper –I

(PETROLOGY)

Unit:1	(i)	Magma, definition, origin & composition
	(ii)	Bowen's reaction series, magmatic differentiation & assimilation
	(iii)	System, phases & component, principles of thermodynamics, Crystallisation and phase equilibrium of unicomponent magma:(Silica), Bi-component magma: Albite-Anorthite and Diposide-Anorthite Tri-component magma: Diopside-Albite-Anorthite
	(iv)	Textures, structures & classification of igneous rocks
	(v)	Forms of igneous rocks
Unit:2	(i)	Rock association in Time & Space, concepts of rock kindreds
	(ii)	Petrographic studies of Acid igneous rocks.
	(iii)	Petrographic studies of Alkaline igneous rocks
	(iv)	Petrographic studies of Basic igneous rock
	(v)	Petrographic studies of Ultrabasic igneous rocks.
Unit:3	(i)	Origin, transportation & deposition of sediments
	(ii)	Dynamics of sedimentary depositional environment; Aeolian, fluvial, coastal and abyssal environment.
	(iii)	Concept of sedimentary facies
	(iv)	Concept of diagenesis
	(v)	Textures & structures of sedimentary rocks.
Unit:4	(i)	Classification of sedimentary rocks.
	(ii)	Petrography of sedimentary rock; rudaceous, arenaceous, calcareous sedimentary rocks.
	(iii)	Metamorphism; definition, agents, facies & grade
	(iv)	Textures, structures & classification of metamorphic rocks.
	(v)	Equilibrium & non-equilibrium reactions in metamorphism.
Unit:5	(i)	Paragenetic diagrams; projective analysis A.C.F & A.K.F. diagrams
	(ii)	Progressive metamorphism of Argillaceous rocks.
	(iii)	Progressive dynamo-thermal metamorphism of impure limestone.
	(iv)	Progressive dynamo-thermal metamorphism of basic igneous rocks.
	(v)	Petrographic provinces of India.

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Practical:

(1) Diagrammatic representation of various forms & structures of igneous, sedimentary & Metamorphic rocks

(2) Megascopic studies of various sedimentary, metamorphic & igneous rocks.

(3) Microscopic studies of various sedimentary, metamorphic & igneous rocks.

(4) Norm calculation

(5) Diagrammatic representation of petrographic provinces of India in outline map of India.

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S.Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary environment - H.G. Readings

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कक्षा / Class- B.Sc-II

Paper –II

संरचनात्मक भू–विज्ञान

(STRUCTURAL GEOLOGY)

इकाई–01

(1) संरचनात्मक भूविज्ञान की परिभाषा एवं अध्ययन क्षेत्र।

(2) शैल दृष्यांशों का अध्ययन। दृष्यांशों पर नति तथा ढाल के प्रभाव।

(3) संस्तरण की पहचान। नति एवं नतिलम्ब की माप।

(4) क्लाइनोमीटर एवं ब्रन्टन कम्पास।

(5) संस्तरों के शीर्ष तथा तल की पहचान।

(6) शैलविरूपण की अवधारणा। प्रतिबल तथा विकृति दीर्घवृत्तज की अवधारणा।

इकाई–02

(1) वलन की आकारिकी।

(2) वलन की ज्यामितिक एवं जननिक वर्गीकरण।

(3) स्थलीय तथा भूवैज्ञानिक मानचित्र में वलन की पहचान।

(4) दृश्यांशों पर वलन के प्रभाव।

(5) वलन क्रियाविधि की प्राथमिक अवधारणा।

इकाई–03

(1) भ्रंश आकारिकी। सर्पण और सेपरेशन।

(2) भ्रंश का ज्यामितिक एवं जननिक वर्गीकरण।

(3) स्थलक्षेत्र तथा भूवैज्ञानिक मानचित्र में भ्रंश की पहचान।

(4) दृश्यांशों पर भ्रंश के प्रभाव।

(5) भ्रंशन क्रियाविधि की प्राथमिक अवधारणा।

इकाई–04

(1) संधि; आकारिकी, संधि का ज्यामितिक एवं जननिक वर्गीकरण।

(2) पत्रण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।

(3) रेखण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।

(4) लवण गुम्बद,

(5) प्लूटान; विवर्तनिकी एवं अभिस्थापन

इकाई–05

(1) विषमविन्यास के प्रकार एवं पहचान।

(2) पुरान्तशायी एवं नवान्तशायी, अतिव्यापन तथा अपव्यापन।

(3) विवर्तनिकी की अवधारणा।

(4) प्रायद्वीपीय, सिंधु गंगा के मैदान तथा प्रायद्वीपेत्तर भारत का विवर्तनिकी विन्यास।

(5) त्रिविमीय प्रक्षेपण का संरचनात्मक भूविज्ञान में अनुप्रयोग।

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प्रायोगिक कार्य–

(1) प्राकृतिक संरचनात्मक प्रादर्शों का अध्ययन।

(2) विभिन्न संरचनाओं का प्रादर्शों के माध्यम से अध्ययन।

(3) मानचित्र में दृश्यांश को पूरा करना।

(4) सरल से जटिल संरचनाओं को प्रदर्शित करने वाले मानचित्रों से भूवैज्ञानिक काट बनाना एवं भूवैज्ञानिक इतिहास की विवेचना करना।

(5) संरचनात्मक भूविज्ञान में स्टिरियोग्राफिक प्रोजेक्शन का अनुप्रयोग।

(6) सात दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन।

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Class- B.Sc - II
Paper –II
(STRUCTURAL GEOLOGY)

Unit:1
(i) Definition and scope of Structural Geology. Study of outcrops. Effects of dip and slope on outcrops.
(ii) Identification of bedding. Dip and strike measurement.
(iii) Clinometer and Brunton compass.
(iv) Recognition of top and bottom of beds.
(v) Concept of rock deformation. Concept of stress and strain ellipsoids.

Unit:2
(i) Fold morphology.
(ii) Geometric and genetic classification of folds.
(iii) Recognition of folds in the field and on geological maps.
(iv) Effect of folds on outcrops.
(v) Elementary idea of mechanics of folding.

Unit:3
(i) Fault morphology. Slip and separation.
(ii) Geometric and genetic classification of faults.
(iii) Recognition of faults in the field and on geological maps.
(iv) Effect of faults on outcrops.
(vi) Elementary idea of mechanics of faulting.

Unit:4
(i) Joint morphology; geometric and genetic classification of joints.
(ii) Foliation; terminology, kinds, origin and relation to major structures.
(iii) Lineation: terminology, kinds, origin and relation to major structures.
(iv) Salt domes.
(vii) Plutons; tectonics & emplacement.

Unit:5
(i) Types and recognition of Unconformity.
(ii) Outlier and inlier. Overlap & offlap.
(iii) Concept of tectonics.
(iv) Tectonic framework of Peninsula, Indo-Gangetic Plains and Extra-Peninsular India.
(v) Stereographic projection & it use in Structural Geology.

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Practical-

(1) Study of Natural Structures in hand specimens.

(2) Study of structures with the help of models.

(3) Completion of outcrops.

(4) Preparation of geological section from simple to complex geological maps and its interpretation.

(5) Application of stereographic projection in structural geology.

(6) Geological excursion for seven days.

Books recommended:

(1) संरचनात्मक भूविज्ञान – डॉ.डी.के. श्रीवास्तव

(2) भूवैज्ञानिक संरचनाएँ – डॉ. भरत सिंह राठौर

(3) प्रायोगिक भूविज्ञान (भाग–2) – आर.पी. मांजरेकर

(4) Structural Geology : M.P. Billings.

(5) Theory of Structural Geology : Gokhale, N.W.

(6) Exercises on Geological maps and dip-Strike: Gokhale, N.W.

(7) Outlines of structural Geology: E.S. Hills.

(8) Structural Geology : Hobbs, Means and Williams.

(9) Geological maps : Chiplonkar and Pawar.

27-5-19 27/5/19

B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	ARCHAEOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Archaeological Anthropology, branches of Archaeology: Classical Archaeology, Historical Archaeology, Prehistoric Archaeology and Protohistoric Archaeology. Anthropology as Archaeology. Differences between the Old world and new world Archaeological Traditions. Absolute and Relative Dating.

UNIT – II Geological time scale. The Great Ice Age
Stratigraphy and other evidences of Ice Age: River terraces. Moraines etc. Pluvial and interpluvials
Stone Age tools: Types and Technology.

UNIT – III Age of Paleolithic savagery:
European lower Paleolithic period: Stone tools and cultures
Indian lower Paleolithic period: Sohan Culture & Madrasian Culture.
European Middle Paleolithic Period: Tools & culture; Flake took complex in India
European Upper Paleolithic period; Tools and Culture, main characteristics of the European Paleolithic Home and Cave art and its significance.

UNIT – IV Mesolithic complex in North Europe. Mesolithic complex in Western Europe, Mesolithic Culture in India. Chief feature of Neolithic revolution. Neolithic complex in India.

UNIT – V Metal Age: Copper, Bronze and Iron Age
Urban revolution: General Features
Indus valley civilization: Main Features, Town Planning, Economic activities, origin and decay

20/06/19

B.A. /B.Sc. – Second Year
Session: 2019-20

Name of the Subject :- Anthropology
Paper : - Second
Name of the Paper :- TRIBAL CULTURE OF INDIA
Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I Define tribe and scheduled tribe. Geographical distribution of Indian tribes and their racial and linguistic classification. Contribution of Anthropology in the study of Indian tribes.

Sacred complex, Universalisation and parochialisation, Sanskritisation, westernization, dominant caste.

Tribes and caste, Difference between S.C. and S.T.

Particularly Vulnerable Trible Group (PVTG) of Chhattisgarh (Kamar, Birhor, Hill Korwa. Abujhmariya, Baiga)

UNIT-II Primitive economy:-

Stages of tribal economy: Hunting, food gathering, fishing, shifting and settled agriculture.

Concept of Property and ownership in tribal societies

Problems of tribal people: land alienation, bonded labour, indebtedness, shifting cultivation, irrigation, Unemployment, agricultural labour; Forest and Tribals

New economic anthropology: Exchange- Gifts, barter, trade, ceremonial exchange and market economy

UNIT-III The problems of culture contact: Problems due to urbanization and industrialization, Regionalism

Tribal religion: origin & function, animism, totemism.

Concept and practices of Magic and witchcraft, shamanism, head hunting.

UNIT-IV Political organisation of Indian tribes: Distinction between state and stateless society, law in primitive society

Social organization of Indian Tribes: Matriarchal and patriarchal family,. Lineage and clan, Ways of acquiring mates in tribal societies.

Youth dormitories: Type, organisation and functions.

UNIT-V Tribal development: History of tribal development, the constitutional safeguards for the scheduled tribes.

Tribal problem: isolation, migration, acculturation, detribalization.

Policies, plans and programmes of tribal development and their implementation. Tribal revolts in India.

Contributions of anthropology to tribal development.

Response of the tribal people for development programs of government and NGO

20/06/19

Recommended Readings:

1. Chaudhary, Bhudadeb (Ed.). Tribal Development in India.
2. Elwin,V.A. Philosophy for NEFA.
3. Haimendorf. The Tribes of India: Struggle for survival.
4. Shara B.D. Basic Issues in tribal Development.

20/06/19

B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - Practical

Name of the Paper :- MATERIAL CULTURE AND RESEARCH TOOLS

Total Marks : 50 Pass Marks : 17

OBJECTIVES :

The objective of this practical course is to introduce the student with the primitive material culture and technology used by primitive man and the student will be introduced with various techniques commonly used by social Anthropology.

MATERIAL CULTURE :

Part – I. Identification and technological descriptions of the following.

1. Implements for food gathering, hunting, fishing and agriculture
2. Fire making implements
3. Types of habitations
4. Land and water transport

Part-II Sketching, identification and the description of Paleolithic, Mesolithic and Neolithic tools

(It is essential that students should draw at least five tools of each age)

Part- III Construction of schedule, Geneology and Questionnaire

Each student should collect information through above tools from 10 Respondents.

The Student will be required to maintain practical records of all work done in the practical class.

20/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –II
Subject: Statistics
Paper-I(Paper Code-0853)
Statistical Methods

Unit I

Sampling from a distribution: Definition of a random sample, simulating random sample from standard distributions (uniform, Normal, Exponential), concept of derived distributions of a functions of random variables, concept of a statistics and its sampling distribution. Point estimate of a parameter. Properties of a good estimator, Concept of bias and standard error of an estimate .Standard errors of sample mean, sample proportion. **S**ampling distribution of sum of Binomial, Poisson and mean of Normal distributions. Independence of sample mean and variance in random sampling from a Normal distribution (without derivation).

Unit II

Statistical tests and interval estimation: Null and alternative hypothesis. Types of errors, level of significance, p values, one and two tailed tests, Procedure for testing of hypothesis. Statement of chi-squares, Student's t and F statistics. Testing for the single mean and variance of a univariate normal distribution, testing the equality of two means and testing for the equality of two variances of two univariate normal distributions. Related confidence intervals. Testing for the significance of sample correlation in sampling from bi-variate normal distribution and for equality of means and equality of variances in sampling from bivariate normal populations.

Unit III

Large sample tests: use of central limit theorem for testing and interval estimation of a single mean and a single proportion and difference of two means and two proportions, Fisher's Z transformation and its uses. Pearson's chi-square test for goodness of fit and for homogeneity for standard distributions. Contingency table and test of independence in a contingency table.

Unit IV

Nonparametric tests: Definition of order statistics and their distributions, Non-parametric tests, Sign test for univariate and bivarite distributions, Wilcoxon test, Mann-Whitney test, Run test, median test and Spearman's rank correlation test.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Frund J.E. (2001) Mathematical Statistics, Prentice Hall of India.
2. Goon A.M., Gupta M.K., Das Gupta.B. (1991): Fundamentals of Statistics, Vol.I, World Press, Culcutta.
3. Gupta and Kapoor: Fundamentals of Mathematical Statistics S.Chand & Sons.
4. Hodges, J.L. and Lehman E.L. (1964): Basic Concepts of Probability and Statistics, Holden Day.
5. Mood A.M, Graybill F.A and Boes D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.

ADDITIONAL REFERENCES

1..Bhat B.R., Shrivenkatramana T and Rao Madhava K.S. (1997): A Beginner's Text, Vol. II, New age International (P) Ltd.

2. Rohatgi, V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

3. Snedecor, G.W. and Cochran W.G. (1967): Statistical Methods. Lowa State University Press.

Paper-II (Paper Code-0854)
Sampling Theory and Design of Experiments

Unit I
Concepts of population and sample, need for sampling ,Census and sample survey , Basic concepts in sampling , organizational aspects of survey sampling, sample selection and sample size .
Some basic sampling methods – simple random sampling (SRS) with and without replacement.

Unit II
Stratified random sampling , Systematic sampling , Allocation problems, ratio and regression methods of estimation under SRS.
Non-sampling errors, aquitance of working (questionnaires, sampling design, methods followed in field investigation, principal findings, etc) of NSSO and other agencies undertaking sample surveys.

Unit III
Analysis of variance for one way and two-way classifications. Need for design of experiments, fundamental principal of design, basic designs- CRD, RBD, LSD and their analysis.

Unit IV
Missing plot technique. Analysis of co-variance. Factorial experiments : 2^2, 2^3 factorial experiments, illustrations, main effects and interactions, confounding and illustrations. Yates method of finding treatment totals.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Cocran W.G. (1977): Sampling Techniques, John Wiley and Sons.
2.Des Raj (2000): Sample Survey Theory, Narosa Publishing House.
3.Murthy M.N(1967): Sampling Theory and Methods, Statistical Publishing Society, Calcutta.
4.Singh, D. and Chaudhary,F.S. (1986): Theory and analysis of Sample Survey Designs. New Age International Publisher.
5.Sukhatme P.V., Sukhatme B.V., Sukhatme S. and Ashok C.(1984), : Sample Survey Methods and Its Applications, Indian Society of Agricultural Statistics, New Delhi.
6. Das M.N. and Giri (1986) : Design and analysis of experiments,springer verlag.
7.Goon A.M.,Gupta M.K.,Das Gupta B. (1986): Fundamentals of Statistics, Vol.II, World Press, Culcutta.
8. Joshi,D.D.(1987):Linear Estimation and Design of Experiments,Wiley Eastern.
9. Kempthorne O.(1965) : The Design and Analysis of Experiments,Wiley Eastern.

Paper III:

Practical : Practicals Based on Paper I & II

1. drawing random samples from standard univariate discrete and continuous distributions such as Binomial, Poission, Normal, Cauichy and Exponential.
2. Tests of significance based on Student's t, Chi-square, F. Test of significance of sample correlation coefficient. Use of Z Transformation.Testing of equality of means and equality of variance in sampling from bivariate normal.
3. Large sample tests for means and proportions, tests of goodness of fit and independence of attributes in contingency tables.
4. Nonparametric tests: Sign, Run, Median, Wilcoxon, Mann-Whitney tests.
5. Selection of samples and determination of sample size. Simple random sampling, Statified and systematic sampling. Allocation problem in stratified sampling. Ratio and regression methods of estimation.
6. Analysis of variance for one way and two way classifications. Analysis of CRD, RBD and LSD. Analysis of 2^2 and 2^3 experiments.

DEFENCE - STUDIES

PAPER - I

WESTERN MILITARY HISTORY

(Paper Code - 0867)

Note : The aim of this paper is to give a historical, political & social back ground of the state engaged in the conflicts under study and the factors influencing the development of different forms of warfare and weapons system.

Note : Question will be set from each unit there will be only Internal choice.

UNIT-I
1. Sunt Zu - Founderof MilitaryTheory and philosophy.
2. Clausewitz - War and its relationship with politics.
3. Macheavelli - Renaissance of Art of war.
4. Jomini- Concept of mass armies.

UNIT-II
1. Churchil.
2. MahatmaGandhi.
3. Kautilya.
4. A.Hitler.

UNIT-III
1. Mao TseTung.
2. CheGuevara.
3. Economic and Psychologicalwar.
4. CollectiveSecurity.

UNIT-IV
1. Indo-China War -1962 Causes of war, political&military lesson.
2. Indo - PakWar -1965 Causes of war, political &military lesson.
3. Indo - PakWar - 1971 Causes of war, political &military lesson.
4. Kargil Conflict1999.

UNIT-V
1. Internal & External threats of NationalSecurity.
2. Insurgency andCounter-Insurgency.
3. Terrorism-Problem andSolution.
4. Naxalism - Problem and solution.

REFRENCE BOOKS:

1. HowardM. : Theory and Practice of war
2. ---,,--- : Clausewitz
3. Mao TseTung : Guerilla warfare
4. Palit,D.k. : The lightning War Tadit Yudh
5. Mankekar : War of1971
6. आर.सी. जोहरी : पाश्चात्य सैम्य विचारक
7. शर्मा च निगम : सैम्य विचारक।

PRACTICAL

There shall be a practical examination of 3.5 hours duration carrying 50 Marks. The division of marks shall be as follow:

(a)	Exercise based onMap-reading:		15marks
(b)	T.W.E.S.T.	:	15marks
(c)	Sessionalwork	:	10marks
(d)	Viva-Voce	:	10markss

PART - A

Map-reading:

1. Scales - Definition, method of expressing, construction of simple, time, diagonalandcomparative.
2. Relief and itsrepresentation.
3. Slopes andGradient.
4. Visibility and inter-visibility by Gradient, proportionate and section method.
5. Re-section andinter-section.
6. Grid system-Map reference, Indexto map. Four figure and Sixfigure.

PART - B

7. Organizationand equipment of infantry Platoon and Section.
8. SectionFormation.
9. Indication of Target by various methods.
10. Fire controlorder.
11. Patrols.
12. Battle Procedures(ROFT).
13. VerbalOrder.
14. Message-Writing.

BOOKS RECOMMENDED:

1.Manual of MapReading: Landon Her
2. युद्ध स्थल कला : चौ. नरेन्द्र सिंह
3.एन.सी.सी. परिचय : विष्णु कांत शर्मा।

INDUSTRIAL CHEMISTRY

PAPER – I

(Paper Code - 0871)

M.M. 34

UNIT-I Material Science : Mechanical Properties of materials and change with respect to temperature. **02L**

Material of constructions used in Industry :

Metals and Alloys : Important metals & alloys; iron, copper, aluminium lead, nikel, titanium and their alloys- Mechanical and chemical properties and their applications. **06L**

Cement : Types of cement, composition, manufacturing process, setting of cement. **04L**

Ceramics : Introduction, Types, Manufacturing process, Applications. Refractories. **04L**

UNIT-II Polymeric Mateials : Industrial polymer and comoposite materials- Their constitution, Chemical and physical properties, Industrial applications. **06L**

UNIT-III Glass : Types, composition, manufacture, physical and chemical properties, Applications. **04L**

Corrosion : Various types of corrosion relevant to chemical Industry-Machanism, Preventive methods. **04L**

UNIT-IV Pollution : Air, Oxygen, nitrogen cycle, water, Biosphere, flora and fauna, Energy, soil. **05L**

Pollutants and their statutory limits, pollution evaluation methods. **04L**

UNIT-V Air pollution-various pollutants. water pollution-organic/inorganic pollutants, Noise pollution, sewage analysis, pesticide pollution, Radiation pollution, green house effect, future. **10L**

Books Recommended :

1. Pollution control in chemical & Allied Industries, S.P. Mahajan.
2. Poolution Control in Industries, A Sories of Books by Jones, H.P.
3. Air Pollution - Vol.1 to 4, Editor, STERN, A.C.; Academic Press.
4. Environmental Engineering, G.N. Pandey, Tata McGraw Hill.
5. Homd Book of Air Pollution, A. Parker, Tata McGraw Hill.
6. Science of Ceromic chemical Processing, Hench, L.L.
7. Science of Ceramics, Stewarts, G.H.
8. Chemistry of Cement.
9. Properties of Glass, Morcy, G.W.
10. Chemistry of Glasses, Paul, A.
11. Corrosion, causes & Prevention, Spellur, F.N.

PAPER - II
(Paper Code - 0872)

M.M. 33

UNIT-I Unit processes in organic chemicals manufacture -

Nitration : Introduction - Nitrating agents, Kinetics and mechanism of nitration processes such as nitration of :

i Paraffinic hydrocarbons
ii. Benzene to nitrobenzene and m-dinitrobenzene
iii. Chlorobenzene to o and p nitrochloro benzenes.
iv. Acetanilide to p-nitroacentanilide
v. Toluene

Continous vs batch nitration. **12L**

UNIT-II Helogenation: Introduction-Kintics of helogenation reactions reagents for elogenation, Helogenation of aromatics-side chain and nuclear helogenations, commercial manufacture of chlorobenzenes, chloral, monochloracetic acid and chloromethanes, dichloro fluormethane. **09L**

UNIT-III Sulphonation : Introduction-sulphonating agents, chemical and physical factors in sulphonation, Kinetics and mechanism of sulphonation reaction, commercial sulfonation of benzene, naphthalene, alkyl benzene, Batch vs continous sultphonation. **09L**

UNIT-IV Effluent Treatment and waste Management : Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation. **09L**

UNIT-V Bag fillters, electrostatic precipitator, mist eliminators, wet scrubbers, absorbers, solid waste management, industrial safety. **09L**

Books Recommended :

1. Unit process in Organic synthesis P.M. Groggins, McGraw Hill.
2. Effluent Treatment in process Industries - Inst. of Cham. Engg.
3. Effluent Treatment and waste Disposal - Inst. of Chem. Engg.
4. Effluent Treatment and Disposal - Inst. of Chem. Engg.

PAPER - III
(Paper Code - 0873)

M.M. 33

UNIT-I Oxidation : Introduction-Types of oxidation reactions, oxidizing agents, kinetics and mechanism of oxidation of organic compounds liquid phase oxidation, vapor phase oxidation, commercial manufacture of benzoic acid, maleic anhydride, phthalic anhydride, acrolein, acetaldehyde, acetic acid. **07L**

UNIT-II Hydrogenation : Introduction-Kenetics and thermo-dynamics of hydrogenation reactions, catalysts for hydrogenation reactions, hydrogenation of vegetable oil. manufacture of methanol from carbon monoxide and hydrogen, hydrogenation of acids and esters to alcohols, catalytic reforming. **07L**

Alkylation: Introducton; Types of alkylation, Alkylating agents, Thermodynamics and mechanism of alkylation reactions, manufacture of - alkyl benzenes (for detergent manufacture), ethyl benzene, phenyl ethyl alcohol, N-alkyl anilines (mono and di- methyl anilines) **03L**

UNIT-III Esterification : Introduction; Hydrodynamics and kinetics of esterification reactions, Esterification by organic acids, by addition of unsaturated compounds, esterification of carboxy acid derivaives, commercial manufacture of ethyl acetate, dioctyl phthalate, vinyl acetate, cellulose acetate. **04L**

Amination : (A) By reduction : Intoduction, Methods of reduction-metal and acid, catalytic, sulfide, electrolytic, metal and alkali sulfites, metal hydrides, sodium metal, concentrated caustic oxidation, reduction, commercial manufacture of aniline, m-nitroaniline, p-amino phenol.

(B) By aminolysis : Introduction, aminating agents, factors affecting. **09L**

Hydrolysis : Introduction; hydrolysing agents, kinetics, thermodyanics and mechanism of hydrolysis. **02L**

UNIT-IV Procees Instrumentation : concept of measurement and accuracy Principle, construction and working of following measuring instruments.

Temperature : Glass thermometers, bimetallic thermometer pressure spring thermometer, vapour filled thermometers resistance thermometers. radiation pyrometers.

Pressure : Manometers, barometers, bourdon pressure gauge ; bellow type, diaphragm type pressure gauges, macleod gauges, pirani gauges, etc. **12L**

UNIT-V Liquid level : Direct-indirect liquid level measurement, Float type liquid level gauge, ultrasonic level gauges; bubbler system, density mesurement, viscocity measure- ment. **07L**

24.7.2017 24-7-17 24/7/17 24/7/17 24-7-17

Books Recommended :

1. Unit process in organic synthesis, P.M. Groggins, McGraw Hill.
2. Industrial Instrumentation, Bekmen, D.P., John wrleys.
3. Applied Instrumentation in process Industries, Vol. I, II & III, Andrews, W.G., Gulf Publication.
4. Instrumentation and Control for the process Industries, Borer, S. Elsevier Applied Science Publishers.
5. Chemical Enggineer's Hand book, Perry, J.H. and Green, D. McGraw Hill.

Time : 4 Hours **PRACTICALS** **M.M. 50**

Unit Process : One to two examples of each of the following unit processes. Nitration, sulphonation, friedel-crafts reaction, esterification, hydrolysis, oxidation, Halogenation, chloro-sulfhonation, reduction, polymerization, reactions of diazonium salts. **Instrumental methods of analysis :** Use of colourimeter pH meter, potentiometer, conductometer, refractometer, polarimeter

Materialtesting: Testing of alloys identification of plastics/rubber estimation of yield point, young's modulus, flaredness; Optical, thermal mechanical and electrical properties. **Process Instrumentation :** Transducers of different types. use of Tranducer for measuring flow control. Determinatiaon of flash point and ignition points of liquids.

Water analysis : Solid contents, Hardness, COD and other tests as per industrial specifications.

Flow measuring devices : Floats Monographs of reprsentative raw materials such as sulphuric acid, toluene, sodium, carbonate, sodium hyroxide, carbon tetrachloride benzoic acid (5-6 compounds). Limit tests for heavy metals Pb, AS, Hg, Fe and ash content.

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VOCATIONAL COURSE IN ELECTRONIC EQUIPMENT MAINTENANCE

SCHEME OF EXAMINANTION

		Max. Marks	Min. Pass Marks
Paper - I	Operational Principles of Audio	50	17
Paper - II	Microprocessor Based Instrumentation and Control	50	17
	Practicals	50	17

1. SUBJECT OBJECTIVE :

The objective of this syllabus is to femiliarize students with the fundamentals of electronics and prepares him/her to keep in track with fast change in this field so that he/she is prepared to takenup advance studies or go for self employment. It is proposed to give the students an idea of basics of all the developments in the field of electronics. Efforts are directed to impart some knowledge of computer hardware and software too, which fall in the realu of electronics so that the students become aware of fast changing scene of information superhigh wey also.

2. JOB POTENTIALS :

The students in (by) taking up this course may find adequta job- opportunities in industries or manufacturing firms. They may opt for setting up their own small scale industries of electronics, thus enhancing self employment.

3. **Contents :** As per attached syallbus.
4. Subject scheme.
5. On the job training will be imparted in Summer days.
6. As detailed out in the prospectus.
7. As per the draft given in the syllabus.
8. Permissible combination of subject Physics, Mathemetics & Electonic equipment mathematics.

PAPER - I

(Paper Code - 0859)

OPERATIONAL PRINCIPLES OF AUDIO AND VIDEO EQUIPMENTS

M.M. 50

UNIT-I Revision of All and FH, communication bands, signal sources, Basic Principles of propagation of e.m. wave through atmosphere and ionosphere; ground waves, sky waves, space waves, dead zones etc.

RECEIVING ANTENNAE: Antenna Parameters like gain, radiation pattern, effective aperture. Ferrite AE. Type of antennae like wire, loop, dish, Yagi, telescopic, their construction and operating principles.

SUPERHETERODYNE RECEIVERS: Principles, advantages, block diagram, RF input and AE co upling arrangments, RF amplifiers, mixer, local oscillator, IF amp. Detector, audio amplifier, loud speaker, power requirements, tuning/aligning of receivers, waveforms and voltages at different check points. Circuit reading of various radio sets, repair and trouole shooting, automobile radios.

UNIT-II ELEMENTS OF A TELEVISION SYSTEM : Picture transmission, sound transmis-sion, picture reception, sound reception, synchronisation.

TYPE VIDEO SIGNAL : Scanning sequence details, sync details of the 625 line system, channel bandwidth, vestigial sideband transmission, reception of vestigial sidepand signals, frequency modulation, FH channel band-width, channel bandwidth for colour transmission, allocation of frequancy bands for television bandwidth for colour transmission, allocation or frequancy bands for television signel transmission, television standards.

Picture tubes- monochrome and colour : Beam deflection, face plate, picture tube charecteristics, picture tube circuit controls.

UNIT-III TELEVISION RECEIVERS : Types of television receivers, receiver sections, video detector, video section fundamantals, video emplifiers-design principles, video amplifier circuits, autometic gain control and noise cancelling circuits, syno seperation circuits, syno-processing and AFC circuits, deflection circuits, sound system, RF tuner, video IF amplifiers, receiver power supplies, television receiver antennae, colour television antennae.

TELEVISION APLICATIONS : Television broadcasting, cable television, closed circuit television, theatre television, picture phone and facsimile, video tape recording (VTr, television via satellite, TV games, HDTV, flatoanel TV teleconferancing.

UNIT-IV TAPE RECORDERS : Principles of magnanic recording, characteristies of magnetism, the hysterists loop, recording head, recorded wave-length, response of head during reply, the effect of gap length, low frequency loss, other losses, equalization, the effect of non-linear characeristic of magnification recording bias, A.C. bias, erasin the tape, block diagram of audio tape recorder.

Oscillator, preamplifier, dolby, amplifier, record (play back) head, erase head, tapes (metal polymer), mechanical transport system, stereo recording, double deck, single deck, microphones (RF, Cable), noise, maintenance of mechanial parts, head cleaners, head alignment, graphic equalisers.

UNIT-V TELEPHONES : Modulation, demodulation, modem, subscribar frequency allotment, channel organisation, signalling, svitching, manual exchanges, STD, ISD, EFABX, Intercom-stress on equipment and EPABX, Value added services like FAX E mail.

MEASURING INSTRUMENTS : Multimeters analog/digital, oscilloscopes, signal generators, noise and sound level meters, frequency counters, error sources and precautions during measurement.

GENERAL NOTE : Familiarisation with catalogues, standard specification, knowledge about companies referring to service manual.

PAPER - II

MICROPROCESSOR BASED INSTRUMENTATION AND CONTROL

(Paper Code - 0860)

M.M. 50

UNIT-I MICROCOMPUTER FUNDAMENTALS : Introduction, simplified microcomputer architecture, simplified memory organization, instruction set, simplified CPU organisation, microcomputer operation, Personal computer organization and Word Processor. Data sheet descriptions, pin diagram and function, microprocessor architecture, using the data/address register, using the stack pointer.

UNIT-II THE INTEL 8080/8085 MICROPROCESSOR : Introduction, the 8085 pin diagram and functions, the 8085 architecture, addressing modes, the 8080/8085 instructions set, the 8080/8085 date transfer instructions, the 8080/8085 arithmatic instructions, the 8080/8085 logical instructions, the 8080/8085 stack, I/O, and machine control instructions.

UNIT-III PROGRAMMING THE MICROPROCESSOR : Machine and assembly languages, simplified instruction set, instruction set, arithmetic operations, instruction set-logical operations, instruction set-date transfar operations, instruction set branch operations, instruction set-subroutne all and return operations, instruction set-miscellaneous operations, writing a program, addressing modes, program branching, program looping using subroutines.

Programming the 8080/8085 microprocessor : Introduction, straight-line programs, looping programs, mathematical programs.

UNIT-IV INTERFACING THE MICROFROCESSOR : Introduction, interfacing with ROM, interfacing with RAM, input/output interfacing basics, interfacing with practical I/O ports, synohronizing I/O data transfers using interrupts. address decoding.

UNIT-V Application to illustrate the use of microprocessor in :

(i) Traffic control

(i) Tempereture control

(i) Digital clock

(iv) Stepper motor control

(v) Washing machine control

PRACTICALS

A student is required to do atleast 12 experiments in an academic year, and one month Summer Training. The scheme of practical examination will be as follows :

(i) One experiment of 3 hours duration and one Month Summer Training.

(i) Marks

Experiment	:	25 Marks
Sessional	:	10 Marks
One Month Summer Training	:	15 Marks
Total		**50 Marks**

* The marks for summer training will be awarded by the thachers teadhing the students on the basis of the certificate issued by the external supervisor of the summer training.

LIST OF PRACTICALS

1. Development of soldering skill by constructing a fewcircuits and testing.
2. PCB making.
3. Study of modulator.
4. Study of oscillator.
5. Tape recorder-testing, assembly and dis-assembly.
6. Radio receiver-testing.
7. Study of PA system and i.s. testing.
8. Study of EPABK, wiring and connectivity with telephone instruments.
9. Familiarisation with 8085 Based microprocessor trainer kit. Location of 8085, 8279, 8253 keyboard, display fields, EPROM Programmer, expansion s lot, TTY and serial lines.
10. Entering and executing an assembly language program, codes for insertion, deletion, memory move, block fill, setting and examining ragisters and memory, single step execution of a program.
11. Writing of a prgram to add. subtract and multiply two numbers stored in memory (nnnn & nnnn * 1) and place the result in the subsequent memory, (nnn * 2).
12. Writing of a program to test R.H. for errors by writing O's & 1's in altornaco location and reading it for chaecking.
13. Making of a board with a 3LED's and four switches to connect to the 8085 kit on the expansion slot (8279).
14. Making of a board with a 8 LED's and four switches to connect to the 8-85 kit on the expansion slot (8255).
    (a) Program the 8255 to glow/switch of LED's.
    (b) Program the 8255 to switch on and OFF the LED's every few second according to a given pattern (Hint : The pattern can be 01010101 and 10101010 or 001001100, or any other).

Reference Books:

1. Fundamentals of acoustics : Kinsler & Frey
2. System trouble shooting Handbook : Luces K, Faulken Berry (John Wiley & Sons)
3. Monochrom & Colour Television : P.R. Gulati
4. Television Engineering : Dhake
5. Microprocessor : Gaonkar
6. Microprocessor : B. Ram
7. Microprocessor : Shaum Saries

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B.SC.-II
COMPUTER SCIENCE
PAPER - I
COMPUTER HARDWARE
(PAPER CODE - 0855)

DURATION 3 HOURS **MAX.MARKS 50**

AIM - The emphasis in on the design concepts &organisational details of the common PC,learning the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function ofvarious chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study isrestricted to only the description and understanding part, fence the paper setter isrequested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers;Memory addressing capability of CPU; word length and processing speed of computes.Microprocessors single chip microcomputers; large and small computers. Usersinterface Hardware software and firmware. multi programming multi user system.Dumb smart and intelligent terminals computer network and multi processing, LANparallel processing. Flinn's classification of computers. Computer flow and data flowcomputers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instructionword size, Various addressing mode interrupts and exceptions, some special Controlsignals and I/O devices. Instruction cycle fetch and execute operation, time Diagram,data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtualMemory Semiconductor memory. Memory controller and magnetic memory; RAM;disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive.readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other output devices, I/O port serial data transfer scheme, Micro controller, signal processor,I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming,Program Design, software development, flow & chart multi programming, multiuser,multi tasking Protection, operating system and utility program, application package.

RECOMMENDED BOOKS :

1. Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy EasternLtd.)
2. Computers Today - By Donal H. Sanders
3. Computers Fundamental - By Rajaraman.
4. IBM PC - XT Clones - By GovindaRajalu

B.Sc.-II
PAPER - II
SOFTWARE
(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving through the concept ofobject oriented programming.

OBJECT OF THE COURSE -

1. To introduce the internet & web related technology & learn the intricacies of web-pagedesigning using HTML.
2. To introduce the object oriented programming concept using C++ language.
3. To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, NamingScheme for HTML Documents , HTML document/file, HTML Editor , Explanationof the Structure of the homepage , Elements in HTML Documents ,HTML Tags, BasicHTML Tags, Comment tag in HTML, Viewing the Source of a web page, How todownload the web page source? XHTML, CSS, Extensible Markup Language (XML),Extensible Style sheet language (XSL), Some tips for designing web pages, HTMLDocument Structure. HTML Document Structure-Head Section, Illustration ofDocument Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META,<TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML DocumentStructure-Body Section:-Body elements and its attributes: Background; BackgroundColor; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin,Organization of Elements in the BODY of the document: Text Block Elements; TextEmphasis Elements; Special Elements — Hypertext Anchors; Character-LevelElements; Character References ,Text Block Elements: HR (Horizontal Line); Hn(Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, SpecialElements — Hypertext Anchors ,Character-Level Elements: line breaks (BR) andImages (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLEElement, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & PhysicalStyles, Netscape, Microsoft and Advanced Standard Elements List, FONT,BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT andCENTER Insertion of images using the element IMG (Attributes: SRC (Source),WIDTH, HEIGHT, ALT (Alternative), ALIGN),IMG (In-line Images) Element andAttributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal andExternal Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Linksto a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAMEAnchors ,TITLE attribute, Practical IT Application Designing web pages links witheach other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of objectoriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, PassingArgument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments infunction.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object asfunction argument ,copy constructor ,struct and classes , array as class member,Static Class Data, Static Member Functions, , Friend function, Friend class, operatoroverloading. Type of inheritance, Base class, Derive class. Access Specifier:protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointerand array, pointer and function, pointer and string, memory management, new anddelete, pointer to object, this pointer Virtual Function: Virtual Function, Virtualmember function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, charI/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1. Introduction to HTML	:	KamleshAgarwala, O.P.Vyas, Prateek A. Agrawala (KitabMahal Publication)
2. Let us C++	:	Y. Kanetkar B.P.B Publication
3. Programming in C++	:	E. Balaguruswami
4. Mastering in C++	:	VenuGopal
5. Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2019-20

June 2019 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement CoursePractical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B. Sc. Part II

ELECTRONICS

Paper I

ELB 201: COMMUNICATION ELECTRONICS

Theory: **Max. Marks :50**

Unit-1

Electronic communication: Introduction to communication – means and modes. Needfor modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

Unit-2

Analog Modulation: Amplitude Modulation, modulation index and frequency spectrum.Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

Analog Pulse Modulation: Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

Unit-3

Digital Pulse Modulation: Need for digital transmission, Pulse Code Modulation,Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

Optical Communication: Introduction of Optical Fiber, Block Diagram of optical communication system.

Unit-4

Introduction to Communication and Navigation systems:

Satellite Communication– Introduction, need, Geosynchronous satellite orbits,geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

Unit-5

Mobile Telephony System – Basic concept of mobile communication, frequency bandsused in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitativeonly).GPS navigation system (qualitative idea only)

Reference Books:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rdEdn., 1999, Tata McGraw Hill.
5. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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Paper II

ELB 202 :MICROPROCESSOR ANDMICROCONTROLLER

Theory: **Max. Marks :50**

Unit-1

Microcomputer Organization: Input/Output Devices. Data storage (idea of RAM andROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.
8085 Microprocessor Architecture: Main features of 8085. Block diagram. Pin-outdiagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.

Unit-2

8085 Programming : Instruction classification, Instructions set (Data transfer includingstacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

Unit-3

8051 microcontroller: Introduction and block diagram of 8051 microcontroller,architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

Unit 4

8051 I/O port programming: Introduction of I/O port programming, pin out diagram of8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.
8051 Programming: 8051 addressing modes and accessing memory locations usingvarious addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions,

Unit 5

8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.
Introduction to embedded system: Embedded systems and general purpose computersystems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
5. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
6. Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India
7. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill
8. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures

Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning.

B.Sc.-II
INFORMATION TECHNOLOGY
PAPER - I
DIGITAL CIRCUITS & COMPUTERH/W
(Paper Code - 0874)

UNIT-I(A) Number Systems :
Octal and hexadecimal number, decimal rep., complements, addition, subtraction, multiplication, division, fixed point rep, floating point rep., other binary code- gray code, excess 3 gray, 2421, etc. error detection code.

(B) Boolean Algebra :
Laws, demorgan'stheorem, Simplification boolean expression & logic diagram, positive & negative logic, K-map and simplification of K-map.

UNIT-II Combinational circuits :
Half adder, full adder, flip-flop : SR, JK, D,T, sequential circuits : encoder, decoder, multiplexer, shift register, binary counters, BCD adder.

UNIT-III Multivibratorcircuits :
Monostable, astable, bistable, smitt trigger, clocked RS, master-slave flip-flop, edge triggered flip-flop, latch.
Intergratedcircuits :
RTL, DITL, TTL, CMOS, MOS.

UNIT-IV (A) Central Processing Unit :
Introduction, register organisation, stack organisation, Instruction formats, Addressing modes.
(B) I/O Organisation :
I/O interfaces, Data transfer, types and modes, interrupts, DMA, IOP.

UNIT-V Memory Organisation :
Memory hierarcy, main memory, Auxiliary memory, Associative memory, cache memory, virtual memory, memory management techniques.

REFERENCE TAXT BOOK :

1.	Integrated Electronics	-	Millman&Halkias
2.	Principle of Electronics	-	V.K. Mehta
3.	Digital Electronics	-	R.P. Jain
4.	Computer System Architecture	-	Morris Mano
5.	Digital Electronics & Computer Hardware	-	Morris Mano

B.Sc.-II
PAPER - II
(Paper Code - 0875)

UNIT-I Introduction to OPP : Advantages of OPP, the Object oriented approach, characteristics of object oriented languages : object, classes, inheritance, reusability, polymorphism and C++.

UNIT-II Function **:** function declaration, calling function, function definition, passing arguments to function, passing constant, passing value, fegerence argument, returning by reference, inline function, function overloading, default arguments in function.

UNIT-III Object and Classes, using the Classes Constructor, class destructor, object as function argument, copy constructor, struct and classes, array as class member, static class data, static member functions, friend function, friend class, operator overloading, type of inheritance, base class derive class, access speceifier, protected, member function.

UNIT-IV Pointers : & and * operator pointer variables, pointer to pointer, void pointer, pointer and array, pointer and functions, pointer and string, memory management, new and delete, pointer to object, this pointer, virtual function : virtual function, virtual member function, accesses with pointer, pure virtual function.

UNIT-V File and stream : C++ steams, C++ manipulators, Stream class, string I/O, char I/O, object I/O, I/O with multiple objects, disk I/O.

REFERENCE TEXT BOOKS:

1.	Programming in C++	-	E. Balaguruswami
2.	Mastering in C++	-	VenuGopal
3.	Object Oriented Programming in C++	-	Robert Lafore
4.	Let us C++	-	Y. Kanetkar

PRACTICAL WORK

1. The sufficient Practical work should be done for understanding the paper 2.
2. At least five programs on each unit from unit 2 to unit 5 be prepared.
3. All practical works should be prepared in form of print outs and be valuated while practical examination.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	Environmental Microbiology and Biostatistics	3 hrs.	50
Second	Microbial Physiology and Immunobiotechnology	3 hrs.	50
	PRACTICAL Examination (including sessionals)	4 hrs.	50 (40+10)

Note : During Two months Summer Vacation, students will visit some Industries. He/She will submit "Summer Job-Training Report" in B.Sc. IIrd Year Viva Voce Exam.

PAPER - I

ENVIRONMENTAL MICROBIOLOGY AND BIOSTATISTICS

(Paper Code - 0876)

M.M.50

UNIT-1 Our environment : Soil, water and air. Concept of environment in relation to microbes. Environment included physiological adaptations in microorganisms. Nature of microbial population in soil, water and air. Biogeochemical cycling - Carbon, Nitrogen, Sulphur and Phosphorus.

UNIT-2 Population interactions : Neutralism, Commensalism, Synergism, Mutualism, Antago-nistic relationships. Mycorrhizal associations. VAM and its importance.

UNIT-3 Nitrogen fixation by symbiotic and non-symbiotic microorganisms. Use of microorgan-isms as biofertilizers. Mass cultivation of Rhizobium and Azotobacter. Use of blue-green algae as biofertilizers.

UNIT-4 Liquid waste disposal. Nature of domestic and municipal waste and sewage. Sewage treatment. Solid waste disposal. Methods of disposal of Agricultural waste.

UNIT-5 Basic idea of probability, normal, binomial and poisson distribution. Mean, Mode and Median. Chi-Square test. Exponential and Logarithemic Functions.

PRACTICALS

1. Isolation of Microorganisms from Air.
2. Isolation of Microorganisms from Water.
3. Isolation of Microorganisms from soil.
4. Determination of MPN of faecal contaminants in water.
5. Measurment & confirmation of E. coli in water sample.
6. Biochemical tests for identification of enteric bacteria.
7. Study of Rhizobium from root nodules.
8. Study of symbiotic and non-symbiotic blue-green algae.
9. Problems based on the determination of Mean, Madian and Mode.
10. Problems on Chi-Square Test.
11. Experiments to demonstrate Symbiotic, Antagonistic acticvities and relations amongst microbes and their interactions with plants.

29/7/12 29/7/12

RECOMMENDED BOOKS :

1. Introduction to Soil Microbiology by Martin Alexander.
2. General Microbiology by Pelczar, Reid & Chan.
3. Biofertilizers in Agriculture by N.S. Subba Rao.
4. Statistics by Mishra & Mishra.
5. General Microbiology, Vol. II, by Power & Daginawala.

PAPER - II

MICROBIAL PHYSIOLOGY AND IMMUNABIOTECHNOLOGY
(Paper Code - 0877)

M.M. 50

UNIT-1 Diffusion, gaseous exchange, Osmosis, Plasmolysis, Biochemical properties of membernes, Passive and Active trnaport mechanism. Role of ionophores, group translocation across the memberanes.

UNIT-2 Photosynthetic microbes, Osygenic and non-oxygenic reaction centre. Electron transport, Photophosphorylation, Calvin Cycle. Photorespiration and its significance. Effect of various factors on rate of photosynthesis.

UNIT-3 Respiration mechanisms - Breakdown of carbohydrates through glycolysis, Kreb's cycle. Fermentation. Pentose Phosphate Pathway. Fermentation of alcohol, Citric acid and acetic acid.

UNIT-4 Methanogens and Methylotrophs. Sulphur utilizing bacteria. Sulphate reduction pathway. Economic importance of Methylotrophs and sulphur utilizing bacteria.

UNIT-5 History and Scope of immunology, Types of immunity. Antigen-Antibody reactions. Immunoglobulins - Structure and functions.
Production of Vaccines and Monoclonal antibodies.

PRACTICAL

1. Isolation of photosynthetic bacteria and cyanobacteria from soil.
2. Isolation and characterisation of Methanogens.
3. Study of Hydrogen-production by bacteria.
4. Measurement of nitrate uptake by microorganisms.
5. Study of nitrate and nitrite reduction by microorganisms.
6. Demonstration of evolution during photosynthesis.
7. Demonstration of plasmolysis, osmosis, active and passive transport mechanism.
8. Testing of Blood Groups.
9. Titration of Antigen and Antibody.
10. Precipitation reaction of antigens and antibodies.

BOOK RECOMMENDED :

1. Cell Biology by Pawar.
2. General Microbiology, Vol. II, by Power and Daginawala.
3. Immunology by Davis.
4. Immunology by G.P. Ta

29/7/17 29/7/17

BIOCHEMISTRY

PAPER - I

E N Z Y M O L O G Y **M.M. 50**

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.
Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measure-men and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT- I ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of Kcal/ Km . Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.
Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.
Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

PAPER - II

INTERMEDIARY METABOLISM M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phospho-rylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria.

$\beta-$ oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. Biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

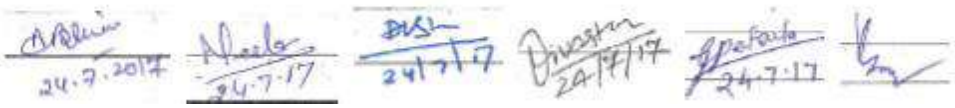
General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.



PRACTICAL

1. Separation of Blood Plasm and Serum
   a. Estimation of proteins from serum by biuret and lowry methods.
   b. Determination of albumin and A/G ratio in serum.
2. Estimation of bilirubin (conjugated and unconjugated) in serum.
3. i Estimation of total lipids in serum by vanillin method.
   ii. Estimation of cholesterol in serum.
4. Estimation of lipoproteins in plasma.
5. Estimation of lactic acid in blood before and after exercise.
6. Estimation of blood urea nitrogen from plasma.
7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.
8. Separation of polar and non-polar lipids by thin-layer chromatography.
9. Estimation of SGPT and SGOT in serum.
10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.
11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.
12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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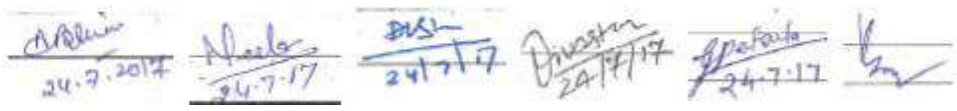

Syllabus of Biotechnology

(B. Sc. II Year)

Session

2019-2020
2020-2021

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
B.Sc. II
BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

List of Books

1. Gerald Karp - Cell and Molecular biology, 4th Edition (2005).
2. Lewis J.Klein Smith and Valerie M.Kish-Principles of cell and molecular biology-Third
3. Edition (2002)
4. P.K. Gupta- Cell and molecular biology, Second Edition (2003), Rastogi publications.
5. Richard M-Twyaman-Advanced Molecular Biology, First South Asian Edition (1998), VivaBooks Pvt. Ltd.
6. K. Wilson and J.Walker (2012) Principle and Techniques of Biotechnology and MolecularBiotechnology.
7. Upadhya and Upadhya : Biophysical Chemistry.
8. David, I. Nelson and Michael M.Cox :Lehniger : Principal of Biochemistry 4th Edition. W.H. Freeman and Company, New York.
9. Buchanan, Gruissemen& Jones (2015) Biochemistry & Molecular Biology of Plant, 2nd edition.

B.Sc. II
BIOTECHNOLOGY

PAPER II

RECOMBINANT DNA TECHNOLOGYAND GENOMICS

M.M. 50

UNIT-I

1. Recombinant DNA technology: General concept. Steps in gene cloning and application.
2. Host controlled Restriction Modification System, Ligases and Polymerases, Klenow fragment, Taq, Pfu polymerase and Nuclease (Endo, Exo and restriction endonuclease).
3. Modification Enzyme (Kinase, Phosphates and terminal deoxynucleotidyl transferase). Reverse Transcriptase.

UNIT –II

1. Vectors: Plasmid, Bacteriophages, Cosmid, SV40 and Expression vectors.
2. Gene Library: Genomic and cDNA library.
3. Selection and Screening of Recombinants: Genetic and Hybridization methods.

UNIT –III

1. PCR: Types of PCR, Steps (Denaturation, Annealing and Extension); Applications, Advantages and Limitation of PCR.
2. Molecular Marker-RFLP, RAPD and Micro array.
3. Human Genome Project.

UNIT-IV

1. Basic concept of Gene Transfer Methods: Microinjection, Electroporation, Lipofection and Microprojectile.
2. Gene Therapy: *In vivo* and *Ex vivo*, Germ line and Somatic gene therapy.
3. Basic idea of Stem cell technology: Types of stems cell cultures and their Significance.

UNIT-V

1. Introduction to Bioinformatics: History, Objective and Application.
2. Major Bioinformatics Resource – NCBI , Types of Databases (Primary and Secondary Databases) , BLAST and FASTA
3. Basic concept of Genomics and Proteomics

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. B.D. Singh (2004) Biotechnology, Expanding Horizons. First Edition. Kalyani Publishers, Ludhiana.
2. P.K. Gupta (2005) Biotechnology and Genomics, Rastogi Publication, Meerut.
3. Stan bury and Whittaker - Principles of Sterilization techniques, First Indian reprint Edition (1997). Aditya Book (P) Ltd. New Delhi.
4. L.E. Casida (1994)Industrial Microbiology Edition .
5. A.H. Patel (2003) Industrial Microbiology 4th Edition.
6. K.S. Bilgrami and A.K. Pandey(1998) Introduction to Biotechnology Edition 2nd (1998)
7. U Satyanarayan (2005) Biotechnology, First Edition Books and Allied (P) Ltd. Kolkata.
8. Atul kumar and VandanaA.Kumar (2004) Plant Biotechnology and tissue culture, Principle and Perspectives, International Books Distributing Co. Lucknow.
10. S Choudhuri, and DB Carlson (2008) Genomics: Fundamentals and applications, 1st edition.
11. TK Attwood and DJ Parry (2009) Introduction of Bioinformatics.
12. Philip E Bourne Helge Whisking (2003) Structural Bioinformatics.
13. Des Higgins and Willie Taylor (2000) Bioinformatics Sequence, Structure and Databanks.

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

दुर्ग विश्वविद्यालय, दुर्ग (छ.ग.)

पाठ्यक्रम

परीक्षा – 2017–18

बी.एससी. भाग–3

B.Sc. Part-3

(Approved by Board of Studies)
Effective from July 2017

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-II examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the thirdyear.
2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-Iexamination.
3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIexamination.
4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIIexamination.
5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department orCollege.
6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

   1. Physics, Chemistry &Mathematics.
   2. Chemistry, Botany &Zoology.
   3. Chemistry, Physics &Geology.
   4. Chemistry, Botany &Geology.
   5. Chemistry, Zoology &Geology.
   6. Geology, Physics &Mathematics.
   7. Chemistry, Mathematics &Geology.
   8. Chemistry, Botany & DefenceStudies.
   9. Chemistry, Zoology & DefenceStudies
   10. Physics, Mathematics & DefenceStudies.
   11. Chemistry, Geology & DefenceStudies
   12. Physics, Mathematics &Statistics
   13. Physics, Chemistry &Statistics
   14. Chemistry, Mathematics &Statistics.
   15. Chemistry, Zoology &Anthropology.
   16. Chemistry, Botany &Anthropology.
   17. Chemistry, Geology &Anthropology.
   18. Chemistry, Mathematics &Statistics.

19. Chemistry, Anthropology & DefenceStudies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defence Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & AppliedStatistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & ComputerApplication
27. Chemistry, Mathematics & ComputerApplication
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & EnvironmentalBiology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry,Botany
38. Chemistry, Biochemistry,Zoology
39. Chemistry, Biochemistry,Microbiology
40. Chemistry, Biotechnology,Botany
41. Chemistry, Biotechnology,Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for coresubjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to thateffect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examinationseparately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementaryexamination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

B.Sc.Part-III

विषय–सूची

1.	Revised Ordinance No. 21	3
2.	Scheme ofExamination	5
3.	FoundationCourse: आधार पाठ्यक्रम	7
4.	Chemistry : रसाायन शास्त्र	9
5.	Physics : (भौतिक शास्त्र)	15
6.	Mathematics	19
7.	Botany (वनस्पति शास्त्र)	26
8.	Zoology (प्राणी शास्त्र)	29
9.	Microbiology(सूक्ष्म जीव विज्ञान)	32
10.	Geology(भूविज्ञान)	35
11.	Statistics(सांख्यिकी)	38
12.	DefenceStudies(रक्षाअध्ययन)	41
13.	IndustrialChemistry(औद्योगिक रसायन)	44
14	Computer Science	48
15.	InformatinTechnology	53
16.	IndustrialMicrobiology	55
17.	Electronics(इलेक्ट्रानिक्स)	57
18.	Anthropology (मानव विज्ञान)	60
19.	Electronic Equipmentmaintenance	63
20.	Biotechnology	60
21.	Biochemistry	68

SCHEME OF EXAMINATION

	Subject	Paper	Max. Mark	Total Mark	Min. Mark
(A)	Compulsory Subject				
	1) Hindi Language	I	75	-	26
	2) English Language	I	75	-	26
(B)	Three Elective Subject :				
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
1.	Physics	I	50		
		II	50	100	33
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50		
		II	50	100	33
		Practical		50	17
5.	Zoology	I	50		
		II	50	100	33
		Practical		50	17
6.	Geology	I	50		
		II	50	100	33
		Practical		50	17
7.	Statistics	I	50		
		II	50	100	33
		Practical		50	17
8.	Anthropology	I	50		
		II	50	100	33
			Practical	50	17
9.	Inde. chemistry	I	34		
		II	33	100	33
		III	33		
		Practical		50	17

Subject	Paper	Max. Marks		Min. Marks
10. Defence Studies	I	50		
	II	50	100	33
	Practical		50	17
11. Micro Biology	I	50		
	II	50	100	33
	Practical		50	17
12. Electronics	I	50		
	II	50	100	33
	Practical		50	17
13. I.T.	I	50		
	II	50	100	33
	Practical		50	17
14. Computer Science	I	50		
	II	50	100	33
	Practical		50	17
15. Biochemistry	I	50		
	II	50	100	33
	Practical	50		

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memoty and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

आधार पाठ्यक्रम
हिन्दी भाषा
(पेपर कोड – 0891)
प्रथम प्रश्न पत्र पूर्णांक – 75

(बी.ए., बी.एच.सी., बी.एच.एस–सी., बी.कॉम., तृतीय वर्ष के पुनरीक्षित एकीकृत आधार पाठ्यक्रम एवं पाठ्य सामग्री का संयोजन 2000–2001 से लागू है)

।। सम्प्रेषण कौशल, हिन्दी भाषा और सामान्य ज्ञान।।

आधार पाठ्सक्रम की संरचना और अनिवार्य पाठ्य पुस्तके–हिन्दी भाषा एवं समसामयिकी– का संयोजन इस तरह किया गया है कि सामान्य ज्ञान की विषय वस्तु – विकासशील देशों की समस्याओं के माध्यम और साथ–साथ हिन्दी भाषा का ज्ञान और उसमें सम्प्रेषण कौशल अर्जित किया जा सके । इसी प्रयोजन से व्याकरण की अन्तर्वस्तु को विविध विधाओं की संकलित रचनाओं और सामान्य ज्ञान की पाठ्य सामग्री के साथ अन्तर्गुम्फित किया गया है । अध्ययन अध्यापन के लिए परी पुस्तक की पाठ्य सामग्री है और अभ्यास के लिये विस्तृत प्रश्नावली है । यह प्रश्नपत्र भाषा का है अतः पाठ्य सामग्री का व्याख्यत्मक या आलोवचनात्मक अध्ययन अनेक्षित नहीं है । पाठ्यक्रम और पाठ्य सामग्री का संयोजन निम्नलिखित पांच इकाईयों में किया जाता है । प्रत्येक इकाई को दो भागो मे विभक्त किया गया है ।

इकाई– 1

1. भारत माता : सुमित्रानंद पंत, परशुराम की प्रतीज्ञा : रामधारी सिंह दिनकर, बहुत बड़ा सवाल : मोहन राकेश, संस्कृति और राष्ट्रीय एकीकरण : योगेश अटल।
2. कथन की शैलियां : रचनागत उदाहरण और प्रयोग।

इकाई– 2

1. विकासशिल देशों की समस्यायें, विकासात्मक पुनर्विचार, और प्रौद्योगिक एवं नगरीकरण ।
2. विभिन्न संरचनाएं।

इकाई– 3

1. आधुनिक तकनीकी सभ्यता, पर्यावरण प्रदूषण तथा धारणीय विकास।
2. **कार्यालयीन पत्र और आलेख।**

इकाई– 4

1. जनसंख्या : भारत के संदर्भ में और गरीबी तथा बेरोजगारी ।
2. अनुवाद।

इकाई– 5

1. उर्जा और शक्तिमानता का अर्थशास्त्र।
2. घटानाओं , समारोहों आदि का प्रतिवेउन और विभिप्प प्रकार के निमंत्रण–पत्र।

मुल्यांकन योजना : प्रत्येक इकाई से एक–एक प्रश्न पूछा जायेगा । प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होगें । प्रत्येक दो–दो खंड (क्रमंशः 'क' और 'ख' में) विभक्त है, इसलिए प्रत्येक प्रश्न के भी दो भाग, कौशल से संबद्ध प्रश्न के अंक 7 होगे। इस प्रकार पूरे प्रश्न पत्र के पूर्णांक 75 होंगे।

PART - II

(Paper Code-0892)

ENGLISH LANGUAGE **M.M. 75**

The question paper for B.A./B.Sc./B.Com./B.H.Sc. III Foundation course, English Language and General Answers shall comprise the following items :

Five question to be attempted, each carrying 3 marks.

UNIT-I	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	15
UNIT-II	Essay writing	10
UNIT-III	Precis writing	10
UNIT-IV	(a) Reading comprehension of an unseen passage	05
	(b) Vocabulary based on text	10
UNIT-V	Grammar Advanced Exercises	25

Note :

Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women and Worm in Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, the question of human social value, new Economic Philosophy Recent Diberaliation Method) Demoration docontralisation (with reference to 73, 74 constitutional Amendment.

Books Prescribed:

Aspects of English Language And Development - Published by M.P. Hindi Granth Academy, Bhopal.

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Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

CHEMISTRY

The new curriculum will comprise of Three papers of 33,33, & 34 marks each and Practical work of 50 marks. The curriculum is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration & the practical work of 180 hrs. duration.

PAPER - I
(Paper Code-0895)
INORGANIC CHEMISTRY M.M. 33

UNIT-I METAL-LIGAND BONDING IN TRANSITION METAL COMPLEXES

Limitations of valence bond theory, an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal field parameters.

Thermodynamic and kirietic aspects of metal complexes.

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, subsititution reactions of square planar complexes.

UNIT-II MAGNETIC PROPERTIES OF TRANSITION METAL COMPLEXES

Types of magnetic behaviour, methods of determining magnetic susceptibility, spin only formula, L-S coupling, correlation of μ s and μ eff. values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes. Electronic spectra of Transition Metal Complexes. Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectro-chemical series. Orgel-energy level diagram for d1 and d2 states, discussion of the electronic spectrum of complexion.

UNIT-III ORGANOMETALLIC CHEMISTRY

Definition, nomenclature and classification of organo metallic compounds. Preparation, properties, bonding and applications of alkyls and aryls of Li, Al, Hg, Sn, & Ti, A brief account of metal-ethylenic complexes and homogeneous hydrogenation, monouclear carbonyls and nature of bodning in metal carbonyls.

UNIT-IV BIOINORGANIC CHEMISTRY

Essential and trace elements in biological processes, metalloporphyrins with special reference to hemoglobin and myoglobin. Biological role of alkali and alkaline earth metals with special reference to Ca^{21}, nitrogen fixation.

UNIT-V HARD AND SOFT ACIDS AND BASES (HSAB) 07 HRS.

Classification of acids and bases as hard and soft. Perason's HSAB concept, acid-base strength and hardness and softness. Symbiosis Silicones and Phosphazenes Silicons and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

REFERENCE BOOKS:

1. Basic Inorganic Chemistry, F.A. Cotton, G. Wilkinson and P.L. Gaus, Wiley
2. Concise Inorganic Chemistry, J.D. Lee, ELBS.
3. Concepts of models of Inorganic Chemistry, B. Douglas, D. McDaniel and J. Alexander, John Wiley
4. Inorganic Chemistry, D.E. Shriver, P.W. Atkkins and C.H. Langford, Oxford.
5. Inorganic Chemistry, W.W. Porterfield, Addison-Wesley.
6. Inorganic Chemistry, A.G. Sharp, ELBS.
7. Inorganic Chemistry, G.L. Miessler and D.A. Tarr, Prentice Hall.
8. Advanced Inorganic Chemistry, Satyas Prakash.
9. Advanced Inorganic Chemistry, Agarwal & Agarwal.
10. Advanced Inorganic Chemistry, Puri & Sharma, S. Naginchand
11. Inorganic Chemistry, Madan, S. Chand & Co.
12. Adhunik Akarbanic Rasayan, A.K. Shrivastav & P.C. Jain, Goel Pub.
13. Ucchattar Akarbanic Rasayan, Satya Prakash & G.D. Tuli, Shyamlal Prakashan
14. Ucchattar Akarbanic Rasayan, Puri & Sharma.

PAPER - II

(Paper Code-0896)

ORGANIC CHEMISTRY **M.M. 33**

UNIT-I A. O RGANICMETALLIC COMPOUNDS

Organomegenesium compounds : Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions.

Organolithium compounds : formation and chemical reactions.

B. Organosulphur Compounds

Nomenclature, structural features, methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine.

Organic Synthesis via Enolates

Active methylene groupalkylation of diethylmalonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate : the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.

UNIT-II BIOMOLECULES

A. Carbohydrates :

Configration of monosaccharides, threo and erytho diastereomers. Formation of glycosides ethers and esters Determination of ring size of monosaccharides. Cyclic structure of D(+) glucose. Structure of ribose and deoxyribose. An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.

B. Proteins and Nucleic acids

Classification and structure of protein levels of protein structure, protein Denaturation / renaturation, Constituents of amino acids Ribonucleicsids and ribouncleotieds, double helical structure of DNA.

UNIT-III A. Synthetic Polymers

Addition or chain growth polymerization. Free radical vinyl polymerization, Ziegler-Natta polymerization, Condensation or Step growth polymerization, Polyesters, polyamides, phenols- formaldehyde resins, urea- formaldehyde resins, epoxy resins and polyurethanes, natural and synthetic rubbers.

B. Synthetic Dyes

Colour and constitution (Electronic Concept). Classification of Dyes. Chemistry of dyes. Chemistry and synthesis of Methyl Orange, Congo Red, Malachite Green, Crystal Violet, Phenolphthalein, fluorescein, Alizarine and Indigo.

UNIT-IV SPECTROSCOPY

A. Mass spectroscopy: mass spectrum fragmentation of functional groups.

B. InfraRed Spectroscopy: IR absorption Band their position and intensity, Identification of IR spectra.

C. UV-Visible Spectroscopy: Beer Lambert's law, effect of Conjugation max Visible spectrum and colour.

D. Anthocyanin as natural colouring matter (Introduction only)

E. Application of Mass, IR, UV-Visible Spectroscopy to organic molecules.

UNIT-V

A. NMR Spectroscopy: Introduction to NMR. Shielding and Number of signal in PMR, Chemical shift and characteristic values, spiltting of Signals and Coupling constant. Application to organic molcules.

B. ^{13}CMR Spectroscopy: Principal & Application.

C. Magnetic Resonance Imaging (MRI)- Introductory idea.

REFERENCE BOOKS:

1. Organic Chemistry, Morrison and Boyd, Prentice-Hall
2. Organic Chemistry, L.G. Wade Jr., Prentice-Hall
3. Fundamentals of Organic Chemistry, Solomons, John Wiley
4. Organic Chemistry, Vol.I, II, III, S.M. Mukherjee, S.P. Singh and R.P. Kapoor, Wiley-Eastern (New-Age)
5. Organic Chemistry, F.A. Carey, McGraw Hill
6. Introduction to Organic Chemistry, Streiweisser, Heathcock and Kosover, Macmillan
7. Organic Chemistry, P.L. Soni
8. Organic Chemistry, Bahi & Bahl
9. Organic Chemistry, Joginder Singh
10. Carbanic Rasayan, Bashi & Bahi
11. Carbanic Rasayan, R.N. Singh, S.M.I. Gupta, M.M. Bakodia & S.K. Wadhwa
12. Carbanic Rasayan, Joginder Singh.
13. Carbanic Resayan, P.L., Soni.
14. Corbanic Rasayan, Bhagchandani, Sahitya Bhawan Publication.
15. Rasayan Vigyan, Bhatnagar, Arun Prakashan.

PAPER - III
(Paper Code-0897)
PHYSICAL CHEMISTRY M.M. 34

UNIT-I QUANTUM MECHANICS

Black body radiation, Plank's radiation law, photoelectric effect, Compton effect. DeBroglie's idea of matter waves, experimental verification Heisenberg's uncertainty principle, Sinosoidal wave equation, Operators : Hamiltonian operator, angular momentum operator, laplacian operators postulate of quantum mechanics Eigen values, Eigen function. Schrodinger time independed wave equation physical
Significance of and . Applications of Schrodinger wave equation: particle in one dimensional box Hydrogenation (separation into three equation's) radial wave function and angular wave function.

UNIT-II QUANTUM MECHANICS-II

Quantum mechanical approach of molecular orbit theory; basic idea criteria for forming M.O and A.O, LCAO approximation, formation of H^{2+} ion, calculation of energy levels from wave functions bonding and antibonding wave functions concept of and orbitals and their characteristics, Hybrid orbital : SP, SP^2, SP^3, Calculation of coefficients Ad^s used in these hybrid orbitals.
Introduction to valence bond model of H^2, Comparison of M.O. and V.B. model, Huckle theory, application of huckel theory to ethane propene etc.

UNIT-III SPECTROSCOPY-I

A. Introduction, characterization of electromagenetic radiation, regions of the spectrum, representation of spectra width and intensity of spectral transition, rotational spectra of calculated diatomic molecules, energy level of rigid rotator, selection rule, determination of bond length qualitative description of non - rigid rotator isotopic effect.

B. Vibrational spectra - Fundamental vibrational and their symmetry, vibrating diatomic molecules, enegy levels of simple harmonic oscillator. Selection Rule, Pure vibrational Spectrum, determination of force constant, diatomic vibrating operator. Anhormonic Oscillator.

C. Raman Spectra : Concept of polarizability, quantum theory of Raman spectra stokes and anti stokes lines pure rotational and vibrational Raman spectra,

Application of Raman spectra stokes and anti stokes lines, pure rotational and vibrational Raman apectra, Applications of Raman spectra.

UNIT-IV SPECTROSCOPY-II

A. Electronic Spectra: Electronic Spectra of diatonic molecule, Frank London principle, types of electronic transitions. Applications of electronic spectra.

B. Photo-chemistry: Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry. Grothus-Drapper law, Stark-Elinstein law, Jablonski diagramπ depicting various process occurring in the excited state, qualitative description of fluorescence, occurring in the excited state, qualitative descripiton of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield photosensitized reactions energy transfer processes (simple examples).

UNIT-V A. Thermodynamics

Energy refered to absolute zero, third law of therodynamics Test of III law of thermodynamics Nerst heat theorem application and limitation of Nerst heat theorem.

B. Physical properties and molecular structure : polarization of molecules, {Classius-Mosotti equation. orientation of dipoles in an electric field. Dipol moment, induced dipole moment, measurement of dipole moment. Temperature methods and refractivity methods. Dipole moment and molecular structure.

C. Magnetic Properties: Parmagenetism diamagnetism, ferromagnetism. Determination of magnetic susceptibility, elucidation of molecular structure.

REFERENCE BOOKS:

1. Physical Chemistry, G.M. Barrow, International student edition, McGaw Hill
2. Basic programming with application, V.K. Jain, Tata McGraw-Hill
3. Computers & Common sense, R. Hunt & Shelly, Prentice-Hall
4. University general chemistry, C.N.R. Rao, Macmillan.
5. Physical Chemistry, R.A. Alberty, Wiley Eastern
6. The elements of Physical Chemistry, P.W. Atkin, Oxford
7. Physical Chemistry through problems, S.K. Dogra & S. Dogra, Wiley Eastern
8. Physical Chemistry, B.D. Khosla
9. Physical Chemistry, Puri & Sharma
10. Bhoutic Rasayan, Puri & Sharma
11. Bhoutic Rasayan, P.L. Soni
12. Bhoutic Rasayan, Bahl & Tuli

PAPER-IV

LABORATORY COURSE 180 Hrs.

Inorganic Chemistry

Synthesis Analysis

(a) Preparation of Sodium trioxalato ferrate (III), $Na_3[Fe(C_2O_4)_3]$ and determination of its composition by permanganometry.

(b) Preparation of Ni-DMG complex, $[Ni(DMG)_2]$

(c) Preparation of copper tetraammine complex, $[Cu(NH_3)_4]SO_4$.

(d) Preparation of cis-and trans-bioxalato diaqua chromate (III) ion.

Gravimetric Analysis

Analysis of Cu as CuSCN or CuO, Ni as $Ni(DMG)_2$, Ba as $BaSO_4$ and Fe as Fe_2O_3

Organic Chemistry

Laboratory Techniques

A Steam Distillation

Napthalene from its suspension in water Clove oil from cloves

Separation of ortho and para-nitrophenols.

B Column Chromatography

Separation of fluorescein and methylene blue Separation of

leaf pigments from spinach leaves

Resolution of recemic mixture of (+,-) mandelic acid.

Qualitative Analysis

Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.

Synthesis of Organic Compounds

(a) Acetylation of salicylic acid, aniline, glucose and hydroquinone. Benzoylation of aniline and phenol.

(b) Aliphatic electrophilic substitution- Preparation of iodoform form ethanol and acetone.

(c) Aromatic electrophilic substitution-Nitration-

Preparation of m-dinitrobenzene, p-nitroacetanilide

Halogenation- Preparation of p-bromoacetanilide, 2,4,6 tribromophenol

(d) Diazotization/Coupling- Preparation of methyl orange and methyl red

(e) Oxidation- Preparation of benzoic acid from toluene

(f) Reduction- Preparation of aniline from nitrobenzene, m-nitroaniline from m-dinitrobenzene.

Physical Chemistry

Electrochemistry

(a) To determine strength of given acid conductometrically using standard alkali solution.

(b) To determine solubility and solubility product of a sparingly soluble electrolyte conductometrically.

(c) To study saponification of ethyl acetate conductometrically.

(d) Determine the ionization constant of a weak acid conductometrically.

(e) To titrate potentionmetrically the given ferrous ammonium sulphate using $KMnO_4/K_2Cr_2O_7$ as titrant and calculate the redox potential of Fe^{2+}/Fe^{3+} system on the hydrogen scale.

Refractometry and Polarimetry

(a) To verify law of refraction of mixtures (e.g. of glycerol and water) using Abbe's refractometer.

(b) To determine the specific rotation of a given optically active compound.

Molecular Weight Determination

(a) Determination of molecular weight of a non-volatile solute by Rast method/Beckmann freezing point method.

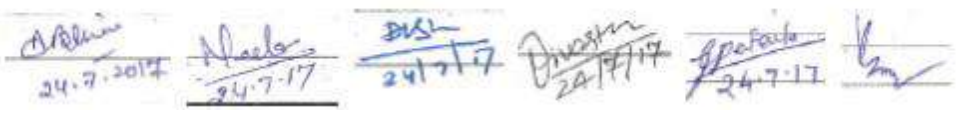
(b) Determination of the apparent degree of dissociation of an electrolyte (e.g., NaCl) in aqueous solution at different concentrations by ebullioscopy.

Colorimetry

To verify Beer-Lambert law for $KMnO_4$/ $K_2Cr_2O_7$ and determine the concentration of the given solution of the substance.

REFERENCE BOOKS :

1. Vogel's qualitative Analysis, revised, Svehla, Orient Longman
2. Standard methods of chemical analysis, W.W. Scott, The Technical Press
3. Experimental Organic Chemistry, Vol. I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, tata McGraw Hill.
4. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern
5. Vogel's Text Book of Practical Organic Chemistry, B.S. Furnis, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchel, ELBS
6. Experiments in general chemistry, C.N.R. Rao & U.C. Agrawal
7. Experiments in Physical Chemistry, R.C. Das & Behra, Tata McGraw Hill
8. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.



8 Hrs. **PRACTICAL EXAMINATION** **M.M.50.**

Five experiments are to be performed.

1. Inorganic - Two experiments to be performed.

   Gravimetric estimation compulsory carrying 08 marks. (Manipulation 3 marks).

   Anyone experiment from synthesis and analysis carrying 04 marks.

2. Organic-Two experiments to be performed.

   Qualitative analysis of organic mixture containing two solid components. compulsory carrying 08 marks (03 marks for each compound and two marks for separation).

One experiment from synthesis of organic compound (Single step) carrying 04 marks.

3. Physical-One physical experiment carrying 12 marks.
4. Sessional 04 marks.
5. Viva Voce 10 marks.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

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PHYSICS

Objectives :

Present course is aimed to provide ample knowledge of basics of Physics which are relevant to the understanding of modern trends in higher physics.

The first paper is aimed at preparing the back ground of modern physics which includes the relativistic and quantum ideas mainly councerned with atomic, molecular and nuclear physics. It consistutes an essential pre-requisite for better understanding of any branch of physics.

The second paper is mainly concerned with Solid State Physics, Solid State Devices and Electronics. This course is quite important from the applicational aspects of modern electronic devices. It also forms the basis of advance electronics including communication technology to be covered at higher level.

The experiments are based mostly on the contents of the theory papers so as to provide comprehensive insight of the subject.

Scheme of Examination :

1. There shall be two theory papers of 3 hours duration each and one practical paper of 4 hours duration. Such paper shall carry 50 marks.
2. Each theory paper will comprise of 5 units. Two questions will be in each unit and the student will have the choice to answer one out of the two.
3. Numerical problems of about 30 percent will compulsorily be asked in each theory paper.
4. In practical paper each student has to perform two experiments during examination.
5. Practical examination will be of 4 hours duration. The distribution of practical marks will be as follows.

   Experiments : 15 + 15 = 30, Viva-voce

   :10 Internal Assessment - 10.

PAPER - I (Paper Code-0893)

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS.

UNIT-I Reference systems, inertial frames, Galilean invariance and conservation laws, propogation of light, Michelson-Morley experiment, search for ether.

Postulates for the special theory of ralativity, Lorentz tranformations, length contraction,time dilation, velocity additon theorem, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass, Compton effect.

UNIT-II Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect.

Wave-particle duality and uncertainty principle : de Broglie's hypothesis for matter waves : the concept of wave and group velocities, evidence for diffraction & interference of particles, experimental demonstration of mater waves. Davisson and Germer's experiment.

Consequence of de Broglie's concepts, quantisation in hydrogen atom, energies of a particle in a box, wave packets.Consequence of the uncertainty relation : gamma ray microscope, diffraction at a slit.

UNIT-III Quantum Mechanics : Schrodinger's equation. Postulatory basis of quantum mechanics, operators, expectation values, transition probabilities, applications to particle in a one-and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step

potential, transmission across a potential barrier.

Hydrogen atom : natural occurrence of n, and m quatum numbers, the related physical quantities.

UNIT-IV Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s,p, d and f states, selection rules. Discrete set of elctronic energies of moleculers, quantisation of vibrational and rotational energies, determination of internuclear distance, pure rotatinal and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra.

Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

UNIT-V Interaction of charged particles and neutrons with mater, working of nuclear detectors, G-M counter, proportional counter and scintillation counter, cloud chambers, spark chamber, emulsions.

Structure of nuclei, basic properties (, μ Q and binding energy), deuteron binding energy, p-p and n-p scattering and general concepts of nuclear forces, Beta decay, range of alpha particle Geiger-Nuttal law. Gamow's explanation of beta decay, alpha decay and continuous and discrete spectra.

Nuclear reactions, channels, compound nucleus, direct reaction (concepts). Shell model & liquid drop model, fission and fusion (concepts), energy production in stars by p-p and carbon cycles (concepts).

TEXT AND REFERENCE BOOKS :

1. H.S. Mani and G.K. Metha : "Introduction to Modern Physics"" (Affiliated East-West Press, 1989)
2. A Beiser, "Prospective of Modern Physics"
3. H.E. White, Introduction to Atomic Physic"
4. Barrow, "Introduction to Molecular Physics!"
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnik, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).

PAPER-II (Paper Code-0894)

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

UNIT-I Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law. Bonding in solids, classification. Cohesive energy of solid. Madelung constant, evaluation of Parameters.

Specific heat of solids, classical theory (Dulong-Petit's law). Einstein and Debye theories. Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

UNIT-II Free electron model of a metal, Solution of one dimensional Schrodiner equation in a constant potential. Density of states. Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details). Metals, Insulator and Semiconductors. Hall effect.

Dia, Para and Ferromagnetism. Langevin's theory of dia and para-magnetism. Curie-Weiss's Law. Qualitative description of Ferromagnetism (Magnetic domains), B-H. curve and Hysteresis loss.

UNIT-III Intrinsic semiconductors, carrier concentration in thermal equlibrium, Fermi level, Impurity semiconductor, doner and acceptor levels, Diode equation, junctions, junction breakdown, Depletion width and junction capacitance, abrupt junction, Tunnel diode, Zener diode. Light emmitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET.

UNIT-IV Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, T and N filters, Zener diode, regulated power supply. Applications of transistors. Bipolar Transistor as amplifier.

Single stage and CE small signal amplifiers, Emitter followers, Transistoras power amplifier, Transistor as oscillator, Wein-Bridge Oscillator and Hartley oscillator.

UNIT-V Introduction to computer organisation, time sharing and multi programming systems, window based word processing packages, MS Word.

Introduction to C programming and application to simple problems of arranging numbers in ascending / descending orders : sorting a given data in an array, solution of simultaneous euation.

BOOKS RECOMMENDED :

1. Introduction to solid state physics : C.Kittel
2. Solid State Physics : A.J. Dekkar
3. Electronic Circuits : Mottershead
4. Electronic Circuits : Millman and Halkias
5. Semiconductor Devices : S.M. Sze
6. Computer fundamental : balaguara Swami

PRACTICALS

MINIMUM 16 (Sixteen) Out of the following or similar experiment of equal standard :

1. Determination of Planck's constant
2. Determination of e/m by using Thomson's tube
3. Determination of e by Millikan's method
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton)
5. Absorption spectrum of iodine vapour
6. Study of alkali or alkaline earth spectra using a concave gra's
7. Study of Zeeman effect for determination of Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant
14. Hysteresis curve of transformer core
15. Hall-probe method for measuement of magnetic field
16. Specific resistance and energy gap of a semiconductor
17. Characteristics of transistor
18. Characteristics of a tunnel diode
19. Study of voltage regulation system
20. Study of a regulated power supply

21. Study of lissajous figures using a CRO
22. Study of VTVM
23. Study of RC and TC coupled amplifiers
24. Study of AF and RF oscillators
25. Find roots of f(x)=0 by using Newton-Raphson method
26. Find roots of F(x)=0 by using secant method
27. Integration by Simpson rule
28. To find the value of V at
31. String manipulations
32. Towers of Honoi (Nonrecursive)
33. Finding first four perfect numbers
34. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS :

1. B.G. Strechman ; "Solid State Electronic Devices". II Edition (Prentice-Hall of India, New Delhi, 1986)
2. W.D. Stanley ; "Electronic Devices, Circuits and Applications" (Prentice Hall, New Jersey, USA, 1988)
3. S. Lipschutsz and A Poe ; "Schaum's Outline of Theory and Problems of Programming with Fortran" (McGraw-Hill Book Co. Singapore, 1986)
4. C Dixon ; "Numerical Analysis"

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MATHEMATIS

There shall be three theory papers. Two compulsory and one optional Each paper carrying 50 marks is divided into five units and each unit carry equal marks.

PAPER - I (Paper Code-0898)

ANALYSIS

REAL ANALYSIS

UNIT-I Series of arbitrary terms. Convergence, divergence and Oscillation. Abel's and Dirichlet's test. Multiplication of series. Double series. Partial derivation and differentiability of real-valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Fourier series. Fourier expansion of piecewise monotonic functions.

UNIT-II Riemann integral. Intergrability of continuous and monotonic functions. The fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Improper integrals and their convergence, Comparison tests. Abel's and Dirichlet's tests. Frullani's integral. Integral as a function of a parameter. Continuity, derivability and integrability of an integral of a function of a parameter.

COMPLEX ANALYSIS

UNIT-III Complex numbers as ordered pairs. Geometric representation of Complex numbers. Stereographic projection.Continuity and differentiability of Complex functions. Analytic functions. Cauchy-Riemann equations. Harmonic functions. lementary functions. Mapping by elementary functions. Mobius transformations. Fixedpoints, Cross ratio. Inverse points and critical mappings. Conformal mappings.

METRIC SPACES

UNIT-IV Definition and examples of metric spaces. Neighbourhoods, Limit points, Interior points, Open and closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, Construction of real numbers as the completion of the incomplete metric space of rationals. Real numbers as a complete ordered field.

UNIT-V Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, Isometry and homeomorphism. Equivalent metrics. Compactness,Sequential compactness. Totally bounded spaces. Finite intersection property. Continuous functions and compact sets, Connectedness, Components, Continuous functions and connected sets.

REFERENCES :

1. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. R.R. Goldberg, Real Analysis, Oxford & IBH publishing Co., New Delhi, 1970.
3. S. Lang, Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. Somasundaram and B. Choudhary, A First Coarse in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.
6. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
7. R.v. Churchill & J.W. Brown, Complex Variables and Applications, 5*" Edition, McGraw-Hill, NewYork, 1990.
8. MarkJ. Ablowitz & A.S.Fokas, Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998.
9. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
10. E.t. Copson, Metric Spaces, Cambridge University Press, 1968.
11. P.K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House, New Delhi, 1996.
12. G.F. Simmons, Inroductin to Topology and Modern Analysis, McGraw-Hill, 1963.

PART - II (Paper Code-0899)
ABSTRACT ALGEBRA

UNIT-I Group-Automorphisms, inner automorphism. Automorphism groups and their compu-tations, Conjugacy relation, Normaliser, Counting principle and the class equation of a finite group. Center for Group of prime-order, Abelianizing of a group and its universal property. Sylow's theorems, Sylow subgroup, Structure theorem for finite Abelian groups.

UNIT-II Ring theory-Ring homomorphism. Ideals and Quotient Rings. Field of Quotients of an Integral Domain, Euclidean Rings, Polynomial Rings, Polynomials over the Rational Field. The Eisenstien Criterion, Polynomial Rings over Commutative Rings, Unique factorization domain. R unique factorisation domain implies so is R [x1, x2 ..... xn] Modules, Submodules, Quotient modules, Homomorphism and Isomorphism theorems.

UNIT-III Definition and examples of vector spaces. Subspaces. Sum and direct sum of subspaces, Linear span. Linear dependence, independence and their basic properties.

Basis. Finite dimensional vector spaces. Existence theoremfor bases. Invariance of the number of elements of a basis set. Dimension. Existence of complementary subspace of a subspace of a finite dimensional vector space. Dimension of sums of subspaces. Quotient space and its dimension.

UNIT-IV Linear transformations and their representation as matrices. The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space. Bidual space and natural isomorphism. Adjoint of a linear transformation. Eigenvalues and eigenvectors of a linear transformation. Diagonalisation. Annihilator of a subspace. Bilinear, Quadratic and Hermitian forms.

UNIT-V Inner Product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

REFERENCES :

1. I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
2. N. Jacobson, Basic Algebra, Vols. I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company).
3. Shanti Narayan, A Text Book of Modern Abstract Algebra, S.Chand & Co. New Delhi.
4. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Basic Abstract Algebra (2"" Edition) Cambridge University Press, Indian Edition, 1997.
6. K. Hoffman and R. Kunze,Linear Algebra, 2"" Editon, Prentice Hall. Englewood Cliffs, New Jersey, 1971.
7. S.K. Jain, A. Gunawardena & P.B. Bhattacharya, Basic Linear Algebra with MATLAB. Key College Publishing (Springer-Verlag) 2001.
8. S. Kumaresan, Linear Algebra, A.Geometric Approach, Prentice-Hall of India, 2000.
9. Vivek Sahai and Vikas Bist, Algebra, Norosa Publishing House, 1997.
10. I.S. Luther and I.B.S.Passi, Algebra, Vol. I-Groups, Vol. II-Rings. Narosa Publishing House (Vol. I-1996, Vol. II-1999)
11. D.S. Malik, J.N. Mordeson, and M.K. Sen, Fundamentals of Abstract Algebra, McGraw-Hill International Edition, 1997.

PAPER - III - (OPTIONAL)

(I) PRINCIPLES OF COMPUTER SCIENCE (Paper Code-0900)

UNIT-I **Data Storage -** Storage of bits. Main Memory. Mass Storage. Coding Information of Storage. The Binary System. Storing integers, storing fractions, communication errors. **Data Manipulation -** The Central Processing Unit. The Stored-Program Concept. Programme Execution. Other Architectures. Arithmetic/Logic Instructions. Computer-Peripheral Communication.

UNIT-II **Operating System and Networks -** The Evolutionof Operating System. Operating System Architecture. Coordinating the Machine's Activities. Handling Competition Among Process. Networks. Networks Protocol.

Software Engineering - The Software Engineering Discipline. The Software Life Cycle. Modularity. Development Tools and Techniques. Documentation. Software Ownership and Liability.

UNIT-III **Algorithms -** The Concept of an Algorithm, Algorithm Representation. Algorithm

Discovery. Iterative Structures. Recursive Structures. Efficiency and Correctness.

(Algorithms to be implemented in C++).

Programming Languages - Historical Perspective. Traditional Programming Concepts, Program Units. Language Implementation. Parallel Computing. Declarative Computing.

UNIT-IV **Data Structures -** Arrays. Lists. Stacks. Queues. Trees. Customised Data Types. Object Oriented Programming.

File Structure - Sequential Files. Text Files. Indexed Files. Hashed Files. The Role of The Operating System.

Database Structure - General Issues. The Layered Approach to Database Implementation. The Relational Model. Object-Oriented Database. Maintaining Database Integrity. E-R models.

UNIT-V **Artifical Intelligence -** Some Philosophical Issues. Image Analysis. Reasoning, Control System Activities. Using Heuristics. Artificial Neural Networks. Application of Artificial Intelligence.

Theory of Computation - Turning Machines. Computable functions. A Non computable Function. Complexity and its Measures. Problem Classification.

REFERENCES :

1. J. Glen Brookshear, Computer Science : An Overview, Addition -Wesley.
2. Stanley B. Lippman, Josee Lojoie, C++ Primer (3rd Edition), Addison-Wesley.

PAPER - III - (OPTIONAL)
(II) DISCRETE MATHEMATICS (Paper Code-0901)

UNIT-I **Sets and Propositions -** Cardinality. Mathematical Induction, Principle of Inclusion and exclusion.

Computability and Formal Languages - Ordered Sets. Languages. Phrase Structure Grammars. Types of Grammars and Languages. Permutations. Combinations and Discrete Probability.

UNIT-II **Relations and Functions -** Binary Relations, Equivalence Relations and Partitions. Partial Order Relations and Lattices. Chains and Antichains. Pigeon Hole Principle. **Graphs and Planar Graphs -** Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits. Shortest Paths. Eulerian Paths and Circuits. Travelling Salesman Problem. Planner Graphs.

TREES.

UNIT-III **Finite State Machines -** Equivalent Machines. Finite State Machines as Language Recognizers. Analysis of Algorithms - Time Complexity. Complexity of Problems. Discrete Numeric Functions and Generating Functions.

UNIT-IV **1 Recurrence Relations and Recursive Algorithms -** Linear Recurrence Relations with Constant Coefficients. Homogeneous Solutions. Particular Solution. Total Solution. Solution by the Method of Generating Functions. Brief review of Groups and Rings.

UNIT-V **Boolean Algebras -** Lattices and Algebraic Structures. Duality, Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Expressions. Prepositional Calculus. Design and Implementation of Digital Networks. Switching Circuits.

REFERENCES :

C.L. Liu, Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science Series, 1986.

PAPER - III - (OPTIONAL)
(III) APPLICATION OF MATHEMATICS IN FINANCE AND INSURANCE
(Paper Code-0902)

Application of Mathematics in Finance :

UNIT-I Financial Management - An overview. Nature and Scope of Financial Management.

Goals of Financial Management and main decisions of financial management. Difference between risk, speculation and gambling.

Time value of Money-Interest rate and discount rate. Present value and future valuediscrete case as well as continuous compounding case. Annuities and its kinds.

UNIT-II Meaning of return. Return as Internal Rate of Return (IRR). Numerical Methods like Newton RaphsonMethod to calculate IRR. Measurement of returns under uncertainty situations. Meaning of risk. Difference between risk and uncertainty. Types of risks. Measurement of risk. Calculation of security and Portfolio Risk and Return-Markowitz Model. Sharpe's Single Index Model Systematic Risk and Unsystematic Risk.

UNIT-III Taylor series and Bond Valuation. Calculation of Duration and Convexity of bonds. Financial Derivaties - Futures. Forward. Swaps and Options. Call and Put Option. Call and Put Parity Theorem. Pricing of contingent claims through Arbitrage and Arbitrage Theorem.

Application of Mathematics in Insurance

UNIT-IV Insurance Fundamentals - Insurance defined. Meaning of loss. Chances of loss, peril, hazard, and proximate cause in insurance. Costs and benefits of insurance to the society and branches of insurance-life insurance and various types of general insurance. Insurable loss exposuresfeature of a loss that is ideal for insurance. Life Insurance Mathematics - Construction of Mortality Tables. Computation of Premium of Life Insurance for a fixed duration and for the whole life.

UNIT-V Determination of claims for General Insurance - Using Poisson Distribution and Negative Binomial Distribution-the Polya Case.

Determination of the amount of Claims in General Insurance - Compound Aggregate claim model and its properties, and claims of reinsurance. Calculation of a compound claim density function. F-recursive and approximate formulae for F.

REFERENCES :

1. Aswath Damodaran, Corporate Finance - Theory and Practice, John Wiley & Sons Inc.
2. John C. Hull, Options, Futures, and Other Derivatives, Prentice-Hall of Indian Private Limited.
3. Sheldon M. Ross, An Introduction to Mathematical Finance, Cambridge University Press.
4. Mark S. Dorfman, Introduction to Risk Management and Insurance, Prentice Hall, Englwood Cliffs, New Jersey.
5. C.D. Daykin, T. Pentikainen and M. Pesonen, Practical Risk Theoryfor Actuaries, Chapman & Hall.

PAPER - III - (OPTIONAL)

Theory component will have maximum marks 30.
Practical component will have maximum marks 20.

(IV) PROGRAMMING IN C AND NUMERICAL ANALYSIS (Thoury & Practical) (Paper Code-0903)

UNIT-I Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays. Puppetting of strings. Structures. Pointers. File formatting.

Numerical Analysis

UNIT-II Solution of Equations : Bisection, Secant, Regula Falsi, Newton's Method, Roots of Polynomials : Interpolation : Lagrange and Hermite Interpolation, Divided Differences, Difference Schemes, Interpolation Formulasusing Differences. Numerical Differentiation. Numerical Quadrature : Newton-Cote's Formulas. Gauss Quadrature Formulas, Chebychev's Formulas.

UNIT-III Linear Equations : Direct Methods for Solving. Systems of Linear Equations (Guass Elimination, LU Decomposition, Cholesky Decomposition), Iterative Methods (Jacobi, GaussSeidel, Relaxation Methods).

The Algebraic Eigenvalue problem : Jacobi's Method, Givens' Method, Householder's Method, Power Method, QR Method, Lanezos' Method.

UNIT-IV Ordinary Differential Equations : Euler Method, Single-step Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method, Methods Based on Numerical Integration, Methods Based on Numerical Differentiation, Boundary Value Problems, Eigenvalue Problems.

Approximation : Different Types of Approximation, Least Square Polynomial Approximation, Polynomial Approximation using Orthogonal Polynomials, Approximation with Trigonometric Functions, Exponential Functions, Chebychev Polynomials, Rational Functions.

Unit-V Monte Carlo Methods Random number generation, congruential generators, statistical tests of pseudo-random numbers.

Random variate generation, inverse tranform method, composition method, acceptancerejection method, generation of exponential, normal variates, binomial and Poisson variates.

Monte Carlo integration, hit or miss Monte Carlo integration, Monte Carlo integration for improper integrals, error analysis for Monte Carlo intergration.

REFERENCES :

1. Henry Mullish& Herbert L. Cooper, Spirit of C : An Introductionto Modern Programming, Jaico Publishers, Bombay.
2. B.W. Kernighan and D.M. Ritchie. The C Programming Language 2"d Edition, (ANSI features) Prentice Hall, 1989.
3. Peter A Darnel and Philip E. Margolis, C : A Software Engineering Approach, Narosa Publishing House, 1993.
4. Robert C. Hutehisonand Steven B. Just, Programming using C Language, McGraw Hill, 1988.
5. Les Hancock and Morris Krieger, The C Primer, McGraw Hill, 1988.
6. V. Rajaraman, Programming in C, Prentice Hall of India, 1994.
7. Byron S. Gottfried, Theory and Problems of Programming with C, tata McGraw-Hill Publishing Co. Ltd., 1998.
8. C.E. Froberg,Introduction to Numerical Analysis, (Second Edition), Addison-Wesley, 1979.
9. James B. Scarborough, Numerical Mathematical Anasysis, Oxford and IBHPublishing Co. Pvt. Ltd. 1966.
10. Melvin J. Maron, Numerical Analysis A Practical Approach, Macmillan publishing Co., Inc. New York, 1982.
11. M.K. Jain, 'S.R.K. lyengar, R.K. Jain, Numerical Methods Problems and Solutions, New Age International (P) Ltd., 1996.
12. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.
13. R.Y. Rubistein, Simulation and the Monte Carlo Methods, John Wiley, 1981.
14. D.J. Yakowitz Computational Probability and Simulation, Addison-Wesley, 1977.

PAPER - III - (OPTIONAL)

(IV) PRACTICAL

PROGRAMMING IN C AND NUMERICAL ANALYSIS

LIST OF PRACTICAL TO BE CONDUCTED...

1. Write a program in C to find out the largest number of three integer numbers.
2. Write a program in C to accept monthly salary from the user, find and display income tax with the help of following rules :

Monthly Salary	Income Tax
9000 or more	40% of monthly salary
7500 or more	30% of monthly salary
7499 or less	20% of monthly salary

3. Write a program in C that reads a year and determine whether it is a leap year or not.
4. Write a program in C to calculate and print the first n terms of fibonacci series using looping statement.
5. Write a program in C that reads in a number and single digit. It determines whether the first number contains the digit or not.
6. Write a program in C to computes the roots of a quadratic equation using case statement.
7. Write a program in C to find out the largest number of four numbers using function.
8. Write a program in C to find the sum of all the digits of a given number using recursion.
9. Write a program in C to calculate the factorial of a given number using recursion.
10. Write a program in C to calculate and print the multiplication of given 2D matrices.
11. Write a program in C to check that whether given string palindrome or not.
12. Write a C function seriessum () to calculate the sum of series : $1+X+1/2! X^2+1/3! X^3+..... 1/n! X^n$
13. Write a program in C to determine the grade of all students in the class using Structure. Where structure having following members - name, age, roll, sub 1, sub2, sub3, sub4 and total.
14. Write a program in C to copy one string to another using pointers. (Without using standard library functions).
15. Write a program in C to store the data of five students permanently in a data file using file handling.

PAPER - III - (OPTIONAL)

(V) MATHEMATICAL MODELLING

(Paper Code-0904) The Process of Applied mathematics.

UNIT-I Setting up first-order differential equations - Qualitative solution sketching. Difference and differential equation growth models.

UNIT-II Single-species population models. Population growth-An age structure model. The spread of Technological innovation.

UNIT-III Higher-order linear models- A model for the detection of diabetes. Combat modes.

Traffic models - Car-following models. Equilibrium speed distributions.

UNIT-IV Nonlinear population growth models. Prey-Predator models. Epidemic growth models. Models from political science - Proportional representation-cumulative voting, comparison voting.

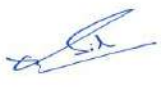
UNIT-V Applications in Ecological and Environmental subject areas- Urban waste water management planning.

REFERENCES :

1. Differential equation models, Eds. Martin Braun, C.S. Coleman, D.A. Drew.
2. Political and Related Models, Steven. J. Brams, W.F. Lucas, P.D. Straftin (Eds.)
3. Discrete and System models, W.F. Lucas, F.S. Roberts, R.M. Thrall.
4. Life Science Models, H.M. Roberts & M. Thompson.

All volumes published as modules in applied Mathematics, Springer-Verlag, 1982.

5. Mathematical Modelling by J.N. Kapur, New Age International, New Delhi.



BOTANY

PAPER-I (Paper Code-0915)

PLANT PHYSIOLOGY, BIOCHEMISTRY AND BIOTECHNOLOGY

M.M. : 50

UNIT-I Plant-water relations : Importance of water to plant life ; physical properties of water; diffusion and osmosis; absorption, transport of water and transpiration ; physiology of stomata.

Mineral nutrition : Essential macro and micro-elements and their role ; mineral uptake; deficiency and toxicity symptoms.

UNIT-II Transport of organic substances : Mechanism of phloem transport ; source-sink relationship ; factors affecting translocation.

Basic of enzymology : Discovery and nomenclature ; characteristics of enzymes ; concept of holoenzyme apoenzyme, coenzyme and cofactors ; regulation of enzyme activity, mechanizm of action.

Photosynthesis : Significance ; historical aspects ; photosynthetic pigments ; action spectra and enhancement effects ; concept of two photosystems; Z-scheme ; photo-phosphorylation ; Calvin cycle ; C4 pathway ; CAM plants ; photorespiration.

UNIT-III Respiration : ATP - the biological energy currency ; aerobic and anaerobic respiration; Kreb's cycle, electron transport mechanism (chemi-osmotic theory) ; redox potential; oxidative phosphorylation ; pentose phosphate pathway.

Nitrogen and lipid metobolism : Biology of nitrogen fixation ;importance of nitrate reductase and its regulations ; ammonium assimilation ; structure and function of lipids; fatty acid biosynthesis ; Beta-oxidation ; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.

UNIT-IV Growth and development : Definitions ; phases of growth and development ; kinetics of growth, seed dormancy, seed germination and factors of their regulation ; plant movements ; the concept of photoperiodism ; physiology of flowering ; florigen concept; biological clocks ; physiology of senescence, fruit ripening ; plant hormones auxins, gibberellins, cytokinins, abscisic acid and ethylene, history of their discovery, biosynthesis and mechanism of action; photomorphogenesis ; phytochromes and cryptochromes, their discovery, physiological role and mechanism of action.

UNIT-IV Genetic engineering : Tools and techniques of recombinant DNA technology ; cloning vectors ; genomic and cDNA library ; transposable elements ; techniques of gene mapping and chromosome walking.

Biotechnology : Functional definition ; basic aspects of plant tissue culture ; cellular totipotency, differentiation and morphogenesis ; biology of Agrobacterium ; vectors for gene delivery and marker genes ; salient achievements in crop biotechnology.

PAPER-II
(Paper Code-0916)
ECOLOGY AND UTILIZATION OF PLANTS M.M. : 50

UNIT-I Plants and environment : Atmosphere (gaseous composition), water (properties of water cycle), light (global radiation, photosynthetically active radiation), temperature, soil (development, soil profiles, physico-chemical properties), and biota.

Morphological, anatomical and physiological responses of plants to water (hydro-phytes and xerophytes), temperature (thermoperiodicity), light (photoperiodism, heliophytes and sciophytes) and salinity.

UNIT-II Community Ecology : Community characteristics, frequency, density, cover, life forms biological spectrum ; ecological succession.
Ecosystems : Structure, abiotic and biotic components ; food chain, food web, ecological pyramids, energy flow ; biogeochemical cycles of carbon, nitrogen and phosphorus.

UNIT-III Population ecology : Growth curves ; ecotypes ; ecads.
Biogeographical regions of India.
Vegetation types of India : Forests and grasslands.

UNIT-IV Utilization of Plants
Food plants : Rice, wheat, maize, potato, sugercane.
Fibres : Cotton and jute.
Vegetable oils : Groundnut, mustard and coconut
General account of sources of firewood, timber and bamboos.

UNIT-V Spices : General account.
Medicinal plants : General account
Beverages : Tea and coffee.
Rubber.

PRACTICAL SCHEME	**M.M. 50**
01. Physiology	08
02. Ecology	08
03. Utilization of Plants	05
04. Biochemistry / Biotechnology	05
05. Spotting (1-5 spots)	10
06. Project work	04
07. Viva V.	05
08. Sessional	05
	50

Suggested Laboratory Exercises

1. To study the permeability of plasma membrance using different concentrations of organicsolvents.
2. To study the effect of temperature on permeability of plasma membrane.
3. To prepare the standard curve of protein and determine the protein content in unknown samples.
4. To study the enzyme activity of catalase and peroxidase as inflenced by pH and temperature.
5. Comparison of the rate of respiration of various plant parts.
6. Separation of chloroplast pigment by solvents method.
7. Determinig the osmotic potential of vacuolar sap by plsmolytic method.
8. Determining the water potental of any tuber.
9. Separation of amino acids in a mixtue by paper chromatography and their identification by comparison with standards.
10. Bioassay of auxin, cytokinin, GA. ABA and ethylene using appropriate plant material.
11. Demonstration of the technique of micropropagation by using different explants, e.g. axillary buds, shoot meristems.
12. Demonstration of the technique of anther culture.
13. Isolation of protoplasts from different tissues using commercially available enzymes.
14. Demonstration of root and shoot formation from the apical and basal portion of stem segments in liquid medium containing different hormones.

Suggested Laboratory Expercises (Ecology)

1. To determine minimum number of quadrats required for reliable estimate of biomass in grasslands.
2. To study the frequency of herbaceous species in grassland and to compare the frequency distribution with Raunkair's Standard Frequency Diagram.
3. To estimate importance Value Index for grassland species on the basis of relative frequency, relative density and relative biomass in protected and grazed grassland.
4. To measure the vegetation cover of grassland through point frame method.
5. To measure the aboveground plant biomass in a grassland.
6. To determine Kemp's constant for dicot and monocot leaves and to estimate the leaf area index of a grassland community.
7. To determine diversity indices (richness, Simpson, Shannon-Wiener) in grazed and protected grassland.
8. To estimate bulk density and porosity of grassland and woodland soils.
9. To determine moisture content and water holding capacity of grassland and woodland soil.
10. To study the vegetation structure through profile diagram.
11. To estimate transparency, pH and temperature of different water bodies.
12. To measure dissolved oxygen content in polluted and unpolluted water samples.
13. To estimate salinity of different water samples.
14. To determine the percent leaf area injury of different leaf samples collected around polluted sites.
15. To estimate dust holding capacity of the leaves of different plant species.

PRACTICAL

Suggested Laboratory Exercises (for Utilization of Plants)

1. Food Plants : Study of the morphology, structure and simple microchemical tests of the food storing tissues in rice, wheat, maize, potato and sugarcane, Microscopic exmaination of starch in these plants (excepting sugarcane)
2. Fibres : Study of cotton flowers, sectioning of the cotton ovules/developing seeds to trace the origin and development of cotton fibres. Microscopic study of cotton and test for cellulose, Sectioning and staining of jute stem to show the location and development of firbres. Microscopic structure. Test for lignocellulose.
3. Vegetable oils : Study of hand sections of groundnut, mustard and coconut and staining of oil droplets by Sudan III and Sudan Black.

4. Field visits : To study sources of firewood (10 plants), timber-yielding trees (10 trees) and bamboos. A list to be prepared mentioning special features.
5. Spices : Examine black pepper, cloves, cinnamon (hand sections) and opened fruits of cardamom and describe them briefly.
6. Preparation of an illustrated inventory of 10 medicinal plants used in indigenous systems of medicine or allopathy : Write their botanical and common names, parts used and disease/disorders for which they are prescribed.
7. Beverages : Cut Sections of boiled coffee beans and tea leaves to study the characterstic structural features.
8. Rubber : Collect illustrative materials of Hevea brasillensis ; morphology of the plant and tapping practices, history of rubber. List the many uses of rubber.

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ZOOLOGY

Paper-I (Paper Code-0917)

Ecology, Environmental-biology ; Toxicology ; Microbiology and Medical Zology.

2. Attempting one question from each unit will be compulsory. 100% chice be given.

UNIT-I (ECOLOGY)

1. Aims and scopes of Ecology.
2. Major ecosystems of the world-Brief intruduction
3. Population- Characteristics and regualtion of densities.
4. Communities and Ecosystems.
5. Biogeochemical cycles
6. Air and water pollution
7. Ecological succession

UNIT-II (ENVIRONMENTAL BIOLOGY)

1. Laws of limiting factors
2. Food chain in a freshwater ecosystem.
3. Energy flow in ecosystem-Trophic levels
4. Conservation of Natural resources
5. Environmental impact Assessment

UNIT-III (TOXICOLOGY)

1. Definition of Toxicity
2. Classification of toxicants
3. Principle of systematic toxicology
4. Toxic agents and their action- Metallic and inorganic agents
5. Animal poisons - Snake-venom, Scorpion and bee poisoning
6. Food pisoning

UNIT-IV (MICROBIOLOGY)

1. General and Applied microbiology.
2. Microbiology of Domestic water and sewage.
3. Microbiology of milk and milk products.
4. Industrial microbiology.

UNIT-V (MEDICAL MICROBIOLOGY)

1. Brief introduction to pathogenic micro-organisurs, Rickettsia, Spirochaetes and Bacteria.
2. Brief account of life-history and pathogenicity of the following pathogens with reference to man ; Prophylaxis and treatment -
   (a) Pathogenic Protozoans - Entamoeba, Trypanosoma, and Giardia
   (b) Pathogenic helminths - Schistosoma
   (c) Nematode Pathogenic parasites of man
3. Vector insects

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PAPER-II

(Paper Code-0918)

(GENETIC'S, CELL PHYSIOLOGY, BIOCHEMISTRY, BIOTECHNOLOGY AND BIOTECHNIQUES)

Note : Ateempting one question from each unit will be compulsory, 100% choice be given.

UNIT-I (GENETIC'S)

1. Linkage and Linkage maps
2. Varieties of gene expression - Multiple alleles ; lithogenesis ; Pleiotropic genes; gene interaction ; epistasis.
3. Sexchromosome systems, and sex-linkage.
4. Mutation and chromosomal alterations ; meiotic consequences.
5. Human genetics - chromosomal and single gene disorders (somatic cell genetics)

UNIT-II(CELL PHYSIOLOGY)

1. General idea about pH and Buffer.
2. Transport across membrane - cell membrane; Mitochondria andEndoplasmic reticulum.
3. Active transport and its mechanism; Active transport in Mitochondria and Endoplasmic reticulum.
4. Hydrolytic enzymes - Their chemical nature, Activation and specificity.

UNIT-III (BIOCHEMISTRY)

1. Amino acids and Peptides - Basic structure and biological function.
2. Carbohydrate and its metabolism - Glycogenesis; Gluconeogenesis; glycolysis, Glycogenolysis; Cosi-cycle.
3. Lipid metabolism - Oxidation of glycerol; oxidation of fatty acid.
4. Protein metabolism - Deamination,Transamination, Transmethylation; Biosynthesis of Protein;

UNIT-IV (BIOTECHNOLOGY)

1. Biotechnology - Scope and importance.
2. Recombinant DNA and Gene cloning.
3. Cloned genes and other tools of biotechnology.
4. Applications of biotechnology in (i) Pharmaceutical industry, and (ii) Food processing industry.

UNIT-V(BIOTECHNIQUE)

Principles and techniques about the following

1. pH meter
2. Colorimeter
3. Microscopy-Light microscopes, Phase contrast and Electron microscopes.
4. Centrifugation
5. Separation of biomolecules by chromatography, and Electrophoresis
6. Histrochemical methods for determination of Protein, Lipids, and carbohydrate

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PRACTICAL WORK

The Practical work in general shall be based on syllabus prescribed in theory.

The candidates will be required to show knowledge of the following :

1. Estimation of population density, Percentage frequency, Relative density.
2. Analysis of Producers and consumers in grassland.
3. Detection of gram-negative and gram-positive bacteria.
4. Blood group detection (A,B, AB & O).
6. R.B.C., W.B.C. count.
6. Blood coagulation time.
7. Preparation of Hematin crystals from blood of rat.
8. Observation of Drosophila, wild and mutant.
9. Chromatography-Paper or gel.
10. Colorimetric estimation of hemoglobin.
11. Mitosis in onion root tip.
12. Biochemical detection of Carbohydrate, Protein and Lipid.
13. Study of Permanent slides of Parasites, based on theory paper.
14. Working Principles of pH meter, Colorimeter, centrifuge and microscopes.

SCHEDULE FOR PRACTICALEXAMINATION

Duration : 4 Hrs.		**Max Marks : 50**	
1.	Haematological Experiment : (R.B.Cs./W.B.Cs. Counting/Blood group detection)	08	marks
2.	Ecological Experiment : (Estimation of Population Density/Frequency/relative Density)	06	marks
3.	Staining of Gram +ve and Gram -ve Bacteria/cytological experiment : Mitosis in onion root tip	05	marks
4.	Biochemical Experiment : (biochemical detection of carbohydrate/protein lipid)	06	marks
5.	Chromatography	05	marks
6.	Spotting : Study of permanent slides of Parasites : 3 Comments on working Principles of pH meter / Calorimeter / centrifuge and Microscope :	10	marks
7.	Viva Voce	05	marks
8.	Sessional :	05	marks

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MICRO-BIOLOGY
SCHEME OF PRACTICAL

Duration : 4 Hrs. **Max Marks : 50**

1.	Characterization and Identification of micro-organism from any given source	15
2.	Biochemical identification of some biodegraded organic molecules	10
3.	Spots (1 to 5)	10
4.	Viva voce	05
5.	Sessional	10
	Total -	**50**

(PRACTICAL SYLLABUS)
MOLECULAR BIOLOGY AND GENETIC ENGINEERING

Characterization of genetic markers of known bacterial strains.

Phage growth curve.

Isolation of DNA from bacteria.

Isolation of plasmid DNA and restriction analysis.

Simple cloning using plasmid DNA as vector and transformation of competent E. coli cells.

Electrophoretic analysis of proteins.

Isolation of Bacteria from air and soil (crop fields)

Isolation of Fungi from air and soil

Study of rhizospheric & Phyllospheric microbes of some economically important plants

Biodegradation study of some organic molecules

microbial assessment of potable water

Analysis of sewage waste

Analysis of Garbages (soild wastes)

REFERENCE :

Philipp Gorhardt, manual of Methods for general Bacteriology. ASM. 536pp.

29/7/17 29/7/17

PAPER-I (Paper Code-0923)

MOLECULAR BIOLOGY AND GENETIC ENGINEERING M.M.50

UNIT-I History of molecular biology, model systems, concepts of molecular biology, Early history of genetic engineering, genetic engineering concepts, ethical issue.

UNIT-II Mutation; spontaneous and induced, base pair change, fram shift, deletion, inversion, random duplication, insertion, useful phenotypes (auxotrophs, conditional lethal, resistance). Revertion vs suppression, Ame's test.

UNIT-III Function of macromolecules; early observation on the mechanism of heredity, DNA as genetic material; basic mechanism of replication, enzymes involved in replication, Enzymes involved in transcription translation, genetic code, regulation of gene expression-transcription, translation and control of gene expression in microbes.

UNIT-IV DNA repair and restriction, types of repair systems, restriction modification systems, types of restriction enzymes, properties and uses, methylation.

Biology of plasmids. Bacteriophages, lytic vs lysosogenic phages, single standard DNA phages, M 13, restriction modification systems, restriction enzymes.

UNIT-V Plasmid and phage vectors, restriction and ligation of vector and passenger DNA, transformation of host cells, selection vs. screening of recombinant colonies, analysis of recombinant clones, DNA sequencing, protein separation and identification methods.

TEXT BOOKS :

1. Essentials of Molecular Biology by GM Malacinski.
2. Genes IX by Benjamin Lewin
3. Molecular Biology by TA Brown.

29/7/17 29/7/17

PAPER - II (Paper Code-0924)

ENVIRONMENTAL AND MEDICAL MICROBIOLOGY

M.M.50

UNIT-I Aerobiology; definition, droplet nuclei, aerosol assessment of air quality, some important air borne diseases caused by bacteria (Diptheria, Peneumonia, Meningitis), virus (Influenza, Chicken pox, Measels) and fungi (mycosis); their symptoms and preventive measures.

UNIT-II Soil microbiology : Physical and chemical characteristics and micro flora of various soil types, rhizosphere, phyllosphere. Brief account of microbial interactions: symbiosis, mutualism, commensalism, competition, amensalism, synergism, parasitism, and predation.

Biofertilizers - biological nitrogen fixation, nitroginase enzyme, nif genes, symbiotic nitrogen fixation, and non-symbiotic nitrogen fixation (Azotobacter, Azospirillum), VAM-ecto-endo-ectendomycorrhizae.

UNIT-III Aquaticd microbiology; ecosystem, fresh water (ponds, lakes, stream) and marine, Water zonation : upwelling, entrophication.

Potability of water - microbial assessment of water quality.

Brief account of water borne diseases (Typhoid, Dysentery, Cholera, Hepatitis) and preventive measures.

UNIT-IV Food spoilage and food borne infections.

A brief mention about biodegradation, xenobiotics, bioaccunmulation, biopestisides and deterioration.

General concept of industrial microbiology and their applications.

UNIT-V Waste Treatment : types of wastes, characterization of solid and liquid waste, waste treatment solid saccharification, gasification, composting.

Liquid waste treatment - aerobic, anaerobic primary, secondary and tertiary methods.

Useful byproducts, mushroom, fuel, fertilizer, Biodegradation of industrial waste.

REFERENCES :

1. Food Microbiology by WC Frazier and D Westhoff.
2. Agricultural Microbiology by Bhagyaraj and Rangaswamy.
3. Bioremediation by KH Baker and DS Herson.
4. Scott's Diagnostic Microbiology by EJ Baron.

29/7/17 29/7/17

PRACTICAL FOR B.SC. PART III
(MICROBIOLOGY)

Characterization of genetic markers of known

bacterial strain Isolation of DNA from bacteria

Isolation of plasmid DNA

Simple cloning using plasmid DNA as vector and transformation of

competent E. coli Electrophoresis of protein / DNA.

Isolation of microorginsms from air, soil and water.

Isolation of pathogenic microorganisms.

Study of rhizospheric and phyllowpheric microbes from economically important plants.

Biodegradation of some organic molecules.

Microbial assessment of potable water.

Analysis of sewage waste, solid waste (garbage).

Isolation of aquatic fungi (zoosporic) by baiting technique.

Isolation of keratinophilic fungi soil by baiting technique

Demonstration of beacterial antagonism.

Microscopic observation of root colonization by VAM fungi.

SCHEME FOR PRACTICAL EXAMINATION

Time : 4 hors **M.M. : 50**

1.	Characterization and identification of microorganism from given source/ Isolation of plasmid DNA/Genomic DNA	15
2.	Biochemical identification of some biodegraded organic molecules/ Microbial assessment of potable water/BOD/COD	10
3.	Spotting (1-5)	10
4.	Viva-Voce	05
5.	Sessional	10
	Total	**150**

29/7/17 29/7/17

विषय–भू–विज्ञान

सैद्धांतिक प्रश्न पत्र – प्रश्न

(पेपर कोड – 0905) पुर्णांक – 50

इकाई–1

1. खनिज उपलब्धता के नियामक तथ्य । वैश्विक खनिज नियम एवं संसाधन
2. दिक्काल में खनिज निक्षेपों का वितरण, पारम्परिक एवं गैर पारम्परिक ऊर्जा संसाधन ' सूर्य –आतय, जल, वायु उष्ण झरने, समुद्र तरंगे ।
3. अयस्य निर्माणकारी खनिजः धात्विक एवं अधात्विक । अयस्क निर्माण की मैग्मीय सांद्रगण विधि।
4. उष्ण जलीय – प्रकियायें, स्कार्न ।
5. उपक्षय उत्पाद एवं अवशिष्ट निक्षेप । आक्सीकरण एवं सल्फाइड समृद्धि प्रक्रम।

इकाई– 2

1. अयस्क निर्माण की अवसादी प्रक्रिया।
2. प्रतिस्थापन एवं जीवाश्विक अवक्षेपण, कोलायडल निक्षेपण, लवणीजल का वाष्पोत्सर्जन।
3. अयस्क निर्माण की कायान्मरणी प्रक्रिया।
4. भू–वैज्ञानिक कालों में वैश्विक विर्तनिकी एंव धातुनिर्मिती।
5. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता तथा भारत में निम्न धातु निक्षेपों का वितरण लौह–मैगनींज–क्रोमियम।

इकाई– 3

1. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता एवं भारत में निम्न धातु निक्षेपों का वितरणः तम्र–सीसा–जस्ता।
2. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता एवं भारत में निम्न धातु निक्षेपों का वितरणः तापसह एवं उर्वरक खनिज।
3. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता एवं भारत में निम्न धातु निक्षेपों का वितरणः तापसह एवं उर्वरक खनिज।
4. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता एवं भारत में निम्न धातु निक्षेपों का वितरणः सीमेंट एवं केमिकल उद्योग में प्रयुक्त खनिज एवं वास्तुप्रास्तर।
5. भू–वैज्ञानिक वितरण, खनिजकीय विशेषता एवं भारत में निम्न धातु निक्षेपों का वितरणः रत्न।

इकाई– 4

1. धातू सांद्रण की प्रमुख विधियां : ताम्र एवं मैग्नीज।
2. खनिज दोहन के पर्यावरणीय प्रभाव।
3. कोयला निक्षेपों की उत्पत्ति, परिभाषा एवं संस्तर विज्ञान।
4. कोल–शैलिकी के मूलभूत तथ्य पीठ, लिग्राइट, विटूमिनस, एंथ्रासाइट।
5. भारतीस कोयला निक्षेप : विशेष संदर्भ में छत्तीसगढ़।

इकाई– 5

1. प्राकृतिक हाइड्रोकार्बन की उत्पत्ति, स्थानांतरण एवं स्थानबद्धता, स्त्रोत एवं संचयकारी।
2. आयलट्रेप के प्रकार – संरचनात्मक, स्तरविज्ञानी एवं मिश्रित।
3. भारत के तटीय एवं अपतटीय पेट्रोलियम निक्षेप।
4. रेडियोधर्मी खनिज : खनिजकीय, भू–रसायन, पूर्वेक्षण तकनीक।
5. भारत वर्ष में रेडियोधर्मी खनिज का वितरण।

विषय–भू–विज्ञान
सैद्धांतिक प्रश्न पत्र–द्वितीय
(पेपर कोड – 0906) **पूर्णांक : 50**
(प्राकृतिक पर्यावरण, दूर संवेदन, भू–जल एवं खनिज–अन्वेषण)

इकाई–1

1. तिक पर्यावरण भू–विज्ञान की अवधारणायें एवं परिभाषा।
2. मुदानिर्माण – मृदा प्रकार।
3. पृथवी की प्राकृतिक–पारिस्थितिकी तंत्र की अवधारणायें – उनकी अंतर्क्रियाएं एवं अर्न्तम्बन्ध।
4. प्राकृतिक पर्यावरण पर मानव का पर्यावरण।
5. नदी मार्ग का अंतरण : मार्ग अंतरण का मृदा अपरदन पर प्रभाव : भूस्खलन एवं बाढ़।

इकाई–2

1. वृहत्त बांध, जलाशय, सुरंगें आदि के निर्माण में स्थल चयन एवं पर्यावरणीय प्रभावों का अध्ययन ।
2. हवाई–छायाचित्रों एवं उपग्रह इमेजियरी का प्रांरभिक अध्ययन।
3. शहरी विकास एवं वृहद्आभियांत्रिकी संरचनाओं की आयोजना में दूर–संवेदन तकनीकों की अनुप्रयोग।
4. फोटो जियोलॉजिकल मानचित्रों का निर्माण।
5. जल चक्र।

इकाई–3भूजलसंचयी शैल

1. शैल एवे उनका वर्गीकरण
2. जलमृतशैलों का वर्गीकरण : डार्सि का नियम एवं उसकी उपयुक्ता।
3. भारत का भूजल–प्रदेश।
4. जलग्रहण प्रबंधन की अवधारणायें।
5. सतही एवं अधों सतही निष्कर्षण विधियां।

इकाई–4

1. आर्थिक खनिजों के लिये पूर्वेक्षण विधियां : ड्रीलिंग, प्रतिनयन एवं आमापन।
2. खनिज पूर्वेक्षण की गुरूत्वी, विद्युतीय एवं चुम्बकीय विधियां।
3. पूर्वेक्षण की हवाई एवं भूकम्पीय विधियां।
4. पूर्वेक्षण की भू–पादकीय विधियां।
5. पूर्वेक्षण की भू–रासायनिक विधियां।

इकाई–5

1. बोरहोललांगिंग एवं विचलन सांखियकी।
2. खनिज खपत का परिवर्तनशील स्वरूप।
3. राष्ट्रीय खनिज नीति ।
4. खनिज–कन्शेसन–नियम।
5. समुद्री खनिज संसाधन एवं तत्संबंधित नियम।

प्रायोगिक प्रश्न पत्र **अधिकतम अंक – 75**

प्रयोगशाला कार्य – 35 अंक **क्षेत्रीय अध्ययन – 15 अंक**

1. अयस्क निर्माणकारी खनिजों के भौतिक एवं प्रकाशीय गुणों का अध्ययन।
2. भारत के मानचित्र में अयस्क निक्षेप एवं आर्थिक महत्व को खनिजों का वितरण।
3. कोयला एवं उसके विभिन्न प्रकारों के नमुनों का स्थूलदर्शी अध्ययन।
4. रेडियोधर्मी खनिज एवं उसके आतिथेय शैलो का स्थूलदर्शी अध्ययन ।
5. खनिज एवं संबंधित प्रयोगशाला अभ्यास कार्य, निक्षेप आंकलन, टनेज फेक्टर आंकलन, टनेज फेक्टर आंकलन, ड्रिलिंग आदि से संबंधित।
6. स्टिरियोस्कोप के द्वारा ऐरियल छाया चित्रों का अध्ससन एवं विवेचना।
7. उपग्रह इमेजियरी का अध्ययन एवं विवेचना।

भू–वैज्ञानिक – क्षेत्रीय अध्ययन–

15 दिवसीय भू–वैज्ञानिक क्षेत्रीय अध्ययन कार्य, जिसमें संरचनात्मक दृष्टि से जटिल क्षेत्रों में भू–वैज्ञानिक मानचित्र एवं शैल नमुनों का संग्रहण तथा प्रयोगशाला कार्य एवं रिपोर्ट का अनुलेखन।

BOOK RECOMMENDED FOR PAPER-I

Evans, A.M. 1993. - Ore Geology and Indusrial Minerals
Sawkins, F.J. 1984 - Metal Deposits in relation in plate Tecto. Springer.
Stanton, R.L. 1972 - Ore Petrology. Mcgraw Hill
Mookherjee A. 2000 - Ore Geniois - a helistic Approach Allied Publisher
Chandra 2000 - Text book of coal (Indian context) Tara book Agency, Varanashi
Selley, R.C.1998 - Elements of Petroleum Geology. Academic Press
Torling D.H. 1981 - Economic Geology and Geofectericks Blackwell
Melustry, H.E. 1962 - Mining Geology 2nd Ed., Asia Pub. House
Arogya Swamy, RPN 1996 - Gourses in rining Geology IV Ed. Oxford IBH
Dahl Kamp F.J. 1993 - Uranium Ore Deposits Springer

BOOK RECOMMENDED FOR PAPER-II

Valdiya K.S. 1987 Environmental Geology-Tata MacgrawHill

Keller, E.A. 1978 - Environmental Geology-Bell & Hewell
Subramanium V. 2001 - Textbook in Environmental Science, Narosa International
Bell, F.G. 1999 - Geological Hazards, Routledge, London
Drury, S.A. 1987 - Image Interpretation in Geology
Siegal, B.S. and Gillespie A.R.1980-Remote Sensing in Geology, John Wiley
Pandey, S.N. - Principles and Application of Photology. Wiley Eastern, New Delhi
Todd. D.K. 1980 - Groundwater Hydrology, John Wiley
Raghunath, N.M. 1982 - Ground Water, Wiley Eastern
Karanth, K.R. 1987 - Groundwater Assessment Development and Management, Tata Macgraw Hill
Subramanium, V.2000 - Water, KingstonPubl. London
Sharma P.V. 1986 - Geophysical Methods in Geology Mcgraw Hill
Krynine, D.H. & Juddwr 1998- Principles of Engineering G. CBS Edition

STATISTICS
PAPER-I
(Paper Code-0907)
APPLIED STATISTICS

UNIT-I Indian Applied Statistical System : Present official statistical system in India, Methods of collection of official statistics, their reliability and limitations, and the principal publications containing such statistics on the topics- population agriculture, industry,
trade, price, labour and employment, transport and communications, banking and finance. (15L)

UNIT-II Demographic Methods : Sources of demographic data - census, register, adhoc survey, hospital records, demographic profiles of Indian census. Measurement of mortality and life tables- crude, death rates, infant mortality rates, death date by cause, standardized death rate, complete life table - its main features, mortality rate and probability of dying, use of survival tables. Measurement of fertility - crude birth rate, general fertility rate, total fertility rate, gross reproduction rate, net reproductionrate. (25L)

UNIT-III Economic Statistics : Index number - its definition, applications of index numbers.
price relatives and quantity or volume relatives, link and chain relatives, problems involved in computation of index numbers, use of averages, simple aggregative and weighted average methods, Laspeyre's, Paasche's and Fisher's index numbers, time and factor reversal tests of index numbers. Consumer Price Index. (20L)

UNIT-IV Static laws of demand and supply, price elasticity of demand, analysis of income and allied size distribution - Pareto distribution, graphical test, fitting of Pareto's law, log normal distribution and its properties, Lorenz curve and estimation of elasticity from time series data. Gini's coefficient.

UNIT-V Time Series Analysis : Economic time series, its different components, Illustrations, additive and multiplicative models, determination of trend, growth curves, analysis of seasonal fluctuations construction of seasonal indices. (15L)

REFERENCES :

1. Croxton F.E. and Cowden D.J. (1969) : Applied General Statistics, Prentice Hall of India.
2. Goon, A.M., Gupta, M.K., Das gupta, B (1986) : Fundamentals of statistics, vol.-II, World Press, Calcutta.
3. Guide to Current Indian Offical Statistics : Central Statistical Organization, Govt. of India, New Delhi.
4. Saluja M.P. ( ) Indian Official statistical Systems, Statistical Publishing Society, Calcutta.
5. Srivastava, O.S. (1983) : A textbook of Demography, Vikas Publishing.

ADDITIONAL REFERENCES :

1. Gupta and Mukhopadhyay P.P. ( ) Aplied Statistics, Central Book Agency.
2. Pressat R. (1978) : Statistical Demography, Methuen and Co. Ltd.

PAPER-II

(Paper Code-0908)

STATISTICAL QUALITY CONTROL AND COMPUTATIONAL TECHNIQUES

UNIT-I Importance of statistical methods in industrial research and practice, specification of items and lot qualities corresponding to visual gauging, count and measurements, types of inspection, determination of tolerance limits. General theory of control charts, causes of variation in quality, control limits, sub-grouping, summary of out-ot control criteria, charts for attributes, np chart, p - chatr, c- chart, u- chart, Charts for variables-

X- and R charts, design of X and R charts versus p-charts, process capability studies.

(30L)

UNIT-II Principle of acceptance sampling- problem of lot acceptance, stipulation of good and bad lots, producer's and consumers risks, single and double sampling plans, their OC functions, concepts of AQL, LTPD, AOQL, average amount of inspection and ASN function, rectifying inspection plans, Sampling inspection plans, Indian Standards Tables Part-I (including applications), IS 2500 Part I. (15L)

UNIT-III Computational techniques : Difference tables and methods of inferpolation, Newton's and Lagrange's methods of interpolation, Divided differences, numerical differentiation and integration, Trapezoidal rule, Simpson's one-third formula, iterative solution of non-linear equations. **(15L)**

UNIT-IV Linear Programming : Elementary theory of convex sets, definition of general linear programming problems (LPP), formulation problems of LPP, examples of LPP, Problems occurring in various fields, graphical and Simplex method of solving an LPP, artificial variables, duality of LPP. Transportation Problem (non-degenerate and balanced cases only), Assignment Problem. (30L)

UNIT-V Four short notes, one from each unit. Student has to answer any two.

REFERENCES :

1. Brownless K.A. (1960) : Statistical theory and Methodology in Science and Engineering. John Wiley and Sons.
2. Grant E.L. (1964) : Statistical Quality Control, McGraw Hill.
3. Duncan A.J. (1974) : Quality Control and Industrial Statistics, Traporewala and Sons.
4. Gass S.I. (1975) : Linear Programming Methods and Applications, McGraw Hill.
5. Rajaraman, V. (1981) : Computer Oriented Numerical Methods, Prentice Hall.
6. Sastry S.S. (1987) : Introductory Methods of Numerical Analysis, Prentice Hall.
7. Taha H.A. (1989) : Operations Research : An Introduction, Macmillan Publishing Company.

ADDITIONAL REFERENCES :

1. Bowker H.A. and Liberman G.T. (1962) : Engineering Statistics, Prentice Hall.
2. Cowden D.J. (1960) : Statistical Methods in Quality Control, Asia Publishing Society.
3. Garvin W.W. (1960) : Introduction to Linear Programming, McGraw Hill.
4. Mahajan M. (2001) : Statistical Quality Control, Dhanpat Rai & Co. (P) Ltd.
5. Rao S.S. (1984) : Optimization Theory and Applications, Wiley Eastern.
6. Krishnamurthy E.V. and Sen S.K. (1976) : Computer Based Numerical Algorithms, Affiliated East-West Press.

PRACTICAL

1. Computing measures of mortality & fertility, Construction of life tables and examples involving use of life tables, Graduation of mortality rates by Gompertz curve, fitting of a logistic curve.
2. Construction of Index Numbers by Laspeyre's, Paasche's, Fisher's method.
3. Determination of trend in a time series, construction of seasonal indices.
4. Fitting of Pareto curve to income data, Lorenz curve of concentration, Estimation of price elasticity of demand form time series data.
5. Drawing of X-R, np, p and c- charts. Drawing of OC curve for single and double sampling plans for attributes, AOQ and ATI curves.
6. Construction of difference tables, use of Newton's Lagrange's methods of interpolation and divided difference formulae, numerical evaluation of integrals using Trapezoidal and Simpson's one-third formulae, solution of non-linear equation by Newton-Raphson iterative method.
7. Formulation of LPP's and their duals. Solving LPPs by graphical and simplex methods, transportation and assignment problems.

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DEFENCE STUDIES

PAPER-I

PROBLEMS OF WAR AND PEACE (Paper Code-0921)

Aim : The objective of this paper is to acquaint the students about the multidimensional problems of war and peace and humanitarian laws.

Note : Question will be set from each unit, there will be only internal choice.

Unit-I U.N.O. AND WORLD PEACE

1. Organs and its role.
2. Main specialized agencies of U.N.O.
3. Role of U.N.O. in world peace.
4. Peace keeping forces of the U.N.O.
5. Veto power and Security Council.

Unit-II WAR AND PEACE

1. Sattlement of International Disputes.
2. Diplomatic agents and Consuls.
3. War Crimes.
4. Neutrality.
5. Intervention.

Unit-III HUMANITARIAN LAW

1. Basic concepts and development of Humanitarian law.
2. UN General Assembly declaration of human rights on Dec. 10, 1948.
3. Protection of Victims and defenceless in armed conflict, POWs, wounded and civilians in Armed Forces.
4. Central Human Right Commission : Organisation and Function.
5. State Human Right Commission : Organisation and Function.

Unit-IV REFUGEE LAW

1. Meaning, Concept and causes of Refugee.
2. Refugee and IDPs.
3. Refugee law in India.
4. Refugee Problem in South Asia.
5. Role of International Committee of Red Cross and UNO in Refugee Problems.

Unit-V LAWS OF WAR

1. Law of Land war.
2. Law of Sea war.
3. Law of Air war.
4. Space law.
5. The International Court of Justice.

SELECTED READINGS :

1. Maunce clark, J : Readings in the Economics of War.
2. International Security : Modern political Science series.
3. Rajani Kothari : Word order.
4. Openhem, I : Use of Forces by states and International law.

PAPER - II

MODERN WARFARE

(Paper Code-922)

Aim : To enable students to appreciate the impact of Political, economic and technological developments on the patterns of conflicts between nations.

Note : Question will be set from each unit, there will be only internal choice.

UNIT-I 1. Development of Nuclear weapons.
2. Effects of Nuclear Explosion.
3. Spread of Nuclear Weapons.
4. Missile and their characteristics.
5. Type of Missiles.

UNIT-II 1. Trends in Science and Technology and their impact on war.
2. Role of Research and Development.
3. Development of Weapons and their impat on tactics
4. Command, Control, Communication and Intelligence (C^3I) in Modern Warfare.
5. Elements of National Power.

UNIT-III 1.Military Satellites.
2. Explosive Bombs.
3. War Gases.
4. Micro Organs : as a weapons.
5. Smart Weapons.

UNIT-IV 1. Rocket Technology and India.
2. Missile Technology and India.
3. Nuclear Technology and India.
4. Atomic Minerals and India.
5. Space Technology and India.

UNIT-V 1. New word order - Political, Social and Economical.
2. Alliance and Regional co-operation.
3. Mobilisation of resources for war.
4. War time economics.
5. New trends.

SELECTED READINGS :

1. Halailan Morton : Coutemporary Military strategy
2. Brodue, Y. : Strategy in the Missile Age.
3. Markabi, Y. : Nuclear war and Nuclear peace
4. Osanka. F.M. : Modern Guerilla warfare
5. Gerald. J. : Defence Psychology
6. Know Kalus : Science and Defence
7. Pandey Girishkant : Yudh mein vigyan aven Tachniki.

PRACTICALS

50 marks

There shall be practical examination of 3.5 hours duration carrying.
The division of marks shall be as follows :

(1) Plain Table Survey	:	15	Marks.
(2) Experimental Military Psychology	:	15	Marks.
(3) Group Descussion & Lectring	:	05	Marks.
(4) Viva-Voce :		05	Marks
(5) Sessional work & Record	:	10	Marks.

Section - A

Plain table Survey by inters section methods. (Atleast ten exercises in a session).

Section - B

Military - Psychology Experiment :

(1) Muller-Layer-IIlusion test.

(2) Koh's Block Design Test.

(3) Allexander Pass Along Test.

Section - C

Group Discussion and Lectures based on current topic on any international & national Problems.

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INDUSTRIAL CHEMISTRY

PAPER - I

(Paper Code-0925)

CHEMICAL PROCESS ECONOMICS **M.M. 34**

UNIT-I 1. Factors involved in project cost estimation, methods employed for the estimation of capital investment. 06L

2. Capital formation, elements of cost accounting. 05L

UNIT-II 1. Interest & investment cost, time value of money equivalence. 03L

2. Depreciation, method of determining depreciation, taxes. 04L

3. Some aspects of marketing, pricing policy. 04L

UNIT-III 1. Profitability criteria, economics of selecting alternatives. 03l

2. Variation of costs with capacity, Break-even point, optimum batch sizes, Production, schedulling etc. 05L

3. Sampling of Bulk materials, techniques of sampling of solids, liquids and gasses.

4. Collection & Processing data. 02L

5. Particle size determination. 02L

6. Rheological properties of liquids, plastics and their analysis.03L

INDUSTRIAL ORGANIZATION

UNIT-IV 1. Concept of scientific management in industry. 04L

2. Functions of management, decision making, planning, organising. directing & control. 09L

3. Location of industry. 03L

UNIT-V 1.Materials management. 05L

2. Inventory control. 04L

3. Management of human resources-selection, incentives, welfare & safety. 05L

BOOKS :

1. Economics of Chemical industry, Hempel, E.H.
2. Plant Design & Economics for Chemical Engineers, Peter Time Rhaus, McGraw Hill.
3. I.C.M.A. Booklets-9 & 10.
4. Industrial Organization & Management, Bethel, L.L.
5. Industrial Organization & Management, Tarachand, Vol. I & II.
6. Book on Management, O.P. Khandelwal.
7. Rheology theory & application, Vol. 5, Elrich, R.F.

PAPER - II
(Paper Code-0926)
PHARMACEUTICALS **M.M. 33**

UNIT-I 1. Historical Background & development of pharmaceutical industry in India in brief. 02L

2. Pharmacopoeias - Development of Indian pharmacopoeia & introduction ot B.P., U.S.P., E.P., N.F. & other Important Pharmacopoeias. 02L
3. Introduction to various types of formulations & roots of administration. 02L
4. Aseptic conditions, need for sterilisation, various methods of sterilisation. 02L

UNIT-II 1. Various types of pharmaceutical excipients their chemistry, process of manufacture & quality, specifications Glidants, lubricants, diluants, preservatives, antioxidants, emulsifying agents, coating agents, binders, coloring agents, flavouring agents geletin & other additives, sorbotol, mannitol, viscosity builders etc. 12L

2. Surgical dressing, sutures, ligatures with respect to the process, equipments used for manufacture, method of sterlilization and quality control. 05L

UNIT-III 1.Pharmaceutical packaging introduction, package selection, packaging materials, ancillary materials, packaging machinery, quality control of packaging materials. 05L

2. F.D.A., Important schedules & some legal aspects of drugs. 03L
3. Pharmceutical quality control (other than the analytical methods covered under core-subject) - sterility testing, pyrogenic testing, glass testing, bulk density of powders, etc. 06L

UNIT-IV 1. Evaluation of crude drugs-Moisture content, extractive value, volatile oil content, foreign organic matter, quantitative microscopic exercises, including starch, leaf content, (palisade ratio, stomatal number & index vein, islet number & vein
termination number), crude fiber content, introduction to chromatographic method
of dentification of crude drugs. 06L

2. Chromatography, Paper chromatography, TLC, HPLC, GLC. 04L
3. Ion chromatography. 01L

INSTRUMENTATION

UNIT-V1. UV-Visible spectroscopy. 03L
2. IR-Spectroscopy non-dispersive IR. 03L
3. NMR Spectroscopy. 03L
4. Atomic Absorption & Flame photometry. 03L
5. Neutron diffraction. 01L
6. X-Ray Fluorescence. 01L
7. Ion Selective Electrodes. 01L

BOOKS :

1. Instumental methods of analysis, Willard, Merit, Dean.
2. Introduction to instrumental methods of analysis, Braun, R.D., McGraw Hill.
3. Analytical chemistry, J.B. Dick, McGraw Hill.
4. Quantitative Inorganic analysis, A. Vogel.
5. Instrumental methods of Analysis, Skoog & West.
6. Instrumental Methods of Analysis, B.K. Sharma.

PAPER -III

(Paper Code-0927)

D R U G S M.M. 33

UNIT-I

1. Phyto-chemicals-Introduction to plant classification & crude drugs, cultivation, collection, preparations for the market & storage of medicinal plants.
2. Classification of various types of drugs with examples.
3. Raw meterials, process of manufacture, effluent handling, etc. of the following bulk drugs :-
   (i) Sulpha drugs-sulphaguandine, sulphamethoxazole.

UNIT-II

1. Chemical constitution of plants including carbohydrates, amino acids, proteins, fats, waxes, volatile oils, terpenoids, steroids, saponins flavonoids, tanins, glycosides, alkaloids.
2. Various isolation procedures for active ingredients with examples for alkaloids, reserpine one for steroids sapogenin, diosgenin, diogron.

UNIT-III

1. Antimicrobial :- Chloramphenicol, Furazolidne, Mercurochrome, Isoniazid, Na-PAS.
2. Analgesic-AntiInflammatory :- Salicylic acid and its derivatives, Ibuprofen, Mefenamic acid.
3. Steroidal Harmones :- Progesterone, Testosterone, Methyl testosterne.

UNIT-IV

1. Vitamins :- Vit.-A, Vit.-B6, Vit.-C.
2. Barbiturates :- Pentobarbital.
3. Blockers :- Propranolol, Atenolol.
4. Cardiovascular Agent :- Methyl dopa.
5. Antihistamins :- Chloropheneramine Maleate.

UNIT-V

1. Products based of fermentation processes :- Brief idea of micro-organisma, their structure, growth & usefulness. Enzyme systems useful for transformation, microbial products.
2. General principles of fermentation processes & product processing.
3. Manufacture of antibiotics - Pencillin-G & semi synthetic pencillines, Rifamycin, Vitamin-B12.
4. Bio-transformation process for prednisolone, 11-hydroxylation in steroids.
5. Enzyme catalysed transformation, manufacture of ephidrine.

24.7.2017 24.7.17 24.7.17 24/7/17 24.7.17

BOOKS :-

1. Practical Pharmacognosy, T.B. Wllis.
2. Practical Pharmacognosy, T.N. Vasudevan.
3. Modern Pharmacognosy, Remstad, McGraw Hill.
4. Indian Pharmacopoea, 1985.
5. British Pharmacopoea, 1990.
6. Hand Book of Drugs & Cosmetic Act, Mehrotra.
7. Pharmaceutical excipients.
8. Pharmaceutical Dosage forms.
9. Principles of Medicinal Chemistry, W.O. Foye, Lea & Febigen, Publication Phidelphia.
10. Text Book of Organic Medicinal & Pharmaceutical Chemistry, Willson, Gisvold, Derge; Lippinett-Toppan.
11. Essentials of Medicinal Chemistry, Korolkovas & Burkhatter, Wiely Interscience.

PRACTICAL

Marks : 50

The Practical examination will be of 08 Hrs. Duration spread over two days carrying 50 Marks.

Two experiments have to be performed.

1. Synthesis of common industrial compounds involving two step reactions. 4-Bromoaniline, 3-Nitroaniline, Sulphanilamide, 4-Aminoben zoic acid, 4-Nitroben zoic acid, dihalobenzenes, Nitrohal obenzenes.
2. Industial analysis of common raw meterials as per industrial specification :- Phenol, Aniline, Formaldehyde, Hydrogen per Oxide, Acetone, Epoxide, Olefins, Oils etc.
3. Demonstration of various pharmaceutical packaging materials, quality control tests of some materials,-A1 Strips, Cartons, Glass bottles.
4. Limit tests for chlorine, heavy metals, arsenic, etc. of two representative bulk drugs.
5. Demonstration of various pharmaceutical products.
6. Active Ingradient analysis of few types of formulations representing different methodsof analysis-acidimetry, alkalimetry, non-aqueous.
7. Determination of sulphate ash, loss of drying & other tests of bulk drugs, complete I.P. monograph of three drugs representing variety of testing methods.
8. Evaluation of crude drugs-macroscopic examination-determination & identification of starch grannules, calcium oxalate.
9. Palisate ratio, stomatal index-determination & Identification of few drugs. Tlc method for identification.
10. Microbiological testing-determination of mic of some aNtibacterial drugs by zone/cup plate method.

DISTRIBUTION OF MARKS :

1. Experiment No. 1.	20
2. Experiment No. 2.	10
3. Viva	05
4. Sessional	05
5. Project Work	10
Total	**50**

COMPUTER SCIENCE

PAPER - I

(Paper Code-0909)

COMPUTER HARDWARE PART-C

AIM : The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course :

1. To introduce the overall organisation of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardwares.

N.B. : Since the computer organisation study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1 : ORGANISATION OF Micro-Processor & MIRCO-COMPUTER :-

1. Introduction & organisation of M icro-Computer :

(a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.

(b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparision of I/O mapped and memory mapped I/O.

(c) Input Output Techniques : Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.

2. **An Introduction to the various as :**
   (a) General understanding of different μ P or CPU :
   Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   (b) The Registers of CPU : (Give Example of P-8088) Register organisation of 8088, Scrach pad segment, pointer, Index and Flag, Registers.
   (c) Memory addressing modes of P-8088 : Segment offset; Data addressing modes; Addressing for branch instructions.
   (d) I/O Addressing with P-8088 : Memory mapped I/O & I/O mapped I/O.

UNIT-2 : SYSTEM HARDWARE ORGANISATION OF COMPUTERS :

1. **Hardware Organisation of the Personal Computer :**
   (a) Block diagram with various parts of PC.
   (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard & its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.
   (c) The Serial I/O ports, COM-1 & COM-2.
   (d) The parallel Port for Printer.
   (e) Expansion Slots for RAM.
   (f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.
2. **The Video Display of PCs :**
   (a) Video Monitors; Monochrome and colour.
   (b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.
   (c) Video Control Through ANSI-SYS.
   (d) Video Control Through ROM-BOIS : INT 10H.
   (e) Direct Video Control; Monochrom & colour graphics adapters.
   (f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1. **The ROM-BIOS Services :**
   (a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.
   (b) The ROM-BIOS Diskette Services, INT 13H.
   (c) The ROM-BIOS Serial Port Services, INT 14H.
   (d) The ROM-BIOS Keyboard Services, INT 16H.
   (e) The ROM-BIOS Printer Services, INT 17H.
   (f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.
2. **The fundamental of Operating System viz. DOS/WINDOWS :**
   (a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.
   (b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.
   (c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.
   (d) File Structures of DOS ;
   (e) The DOS Interrupts : INT 20H-2FH
   (f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.
   (g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1. **Disk and Files under DOS :**
   (a) Logical Structure of a Disk : Organisation of disk for use; Boot record ; FAT files; disk or root directory.
   (b) File Organisation on a DOS disk : Logical volumes ; Sub directories; Volume lables.
   (c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.
2. **Memory Allocation, Program Loading and Execution :**
   (a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.

(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.

(c) Loading the program overlays through EXEC.

UNIT-5 : ORGANISATION OF HARDWARE BY OPERATING SYSTEM :

1. Interrupt Handling through DOS :

(a) Types of interrupts.

(b) Interrupt Vector Table in PC.

(c) Interrupt Service Routines.

(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interupt INT 28H ; Patching memory resident routines.

2. Filters for DOS :

(a) Filters in operating systems.

(b) Redirection of I/O under DOS.

(c) The Filters Supplied with DOS.

(d) Writing Filters to run under DOS.

3. Handling of Various Versions of Windows O.S. :

(a) Setup Installation

(b) Trouble shooting

(c) Networking features

Text Book :

1. Hardware and Software of Personal Computers.
   By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).

Supporting Text Books :

1. Digital System from Gates to Mircoprocessor.
   By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).
2. Computer Fundamentals : Architecture & Organisation.
   By B. Ram.. (Wiley Eastern Ltd. New Delhi).

Reference Books :

1. IBM PC-XT and Clones : By Govinda Rajalu.
2. Microprocessor and interfacing : By Douglas Hall.
3. Insight the IBM-PC : Peter Norton.

4. Micriprocessor System : 8086/8088 family architecture, programming & design : By Liu and Gibson.

PAPER - II

(Paper Code-0910)

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course :

1. To introduce Data BAse Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1 : CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model : Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model : Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design : Pitfalls in Relational Database Desing, Decompo-

sition Functional Dependencies, Normalization : 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction : Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views : What is Views, Create, Drop and Retrieving data from views.

(c) Security : Management of Roles, Changing Passward, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

UNIT-4 : G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures : Function, Subroutine, and Property. Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(c) File Organization : Saving data to file, Sequential and Random access file, the desing and coding.

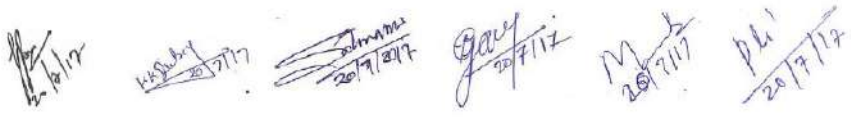
UNIT-5 : V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data : Using the ADO data control, ADO data control properties, binding simple controls : Data list, data combo, Data Grid, Data Form Wizard : single form wizard, Grid form, master/Detail form.

Programming the ADO data control : Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report : Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code : Data reports Events, Binding data reports Directly.



REFERENCE BOOKS :

1. Data Base System Concept : By Hery F. Korth, Tata McGraw Hill
2. Fundamental of Data Base : Nawathe & Elmasri (Pearson educations) System Concept
3. Oracle Complete Reference : By Oracle Press
4. Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House
5. Database Programming VB 6 : By B.P.B. Publication

PRACTICALS :

1. **Practicals on Oracle :**

   At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.

2. **Practicals on Visual Basic :**

   At least 20 pracricals on VB that covering basic and data controls components.

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INFORMATION TECHNOLOGIES

PAPER - I

(Paper Code-0928)

AMPLIFIERS AND OSCILLATORS

UNIT-I POWER AMPLIFIER : Classification of power amplifiers, requirement of power amplifiers, single ended class A power amplifier, and its efficiency, transformer coupled power amplifier, power dissipation curve, harmonic dissipation curve, harmonic distortion in pushpull power amplifier, power and efficiency calculation for pushpull for pushpull power amplifier, Distortion in pushpull power amplifier, Advantages of pushpull power amplifier.

UNIT-II FEEDBACK AMPLIFIERS AND OSCILLATORS : Feedback in amplifiers, types of feedback positive, and negative feedback. Derivation of input and output impedance in voltage and current series feedback. Advantages of negative feedback. Positive feedback. Berkhauson criteria for sustained oscillator. RF oscillators-Hartley oscillatot, Colpetts oscillators (Qualitative study) relaxation osillators, Multivibrators-Astable, Monostable.

UNIT-III OPERATIONAL AMPLIFIER AND POWER CONTROL DEVICES : Differential amplifier, operational amplifier, Characteristics of an ideal OPAMP, definition of input bias current input offset current, current driff, impout offset, common mode rejection ratio, slew rate, universal biasing technique, Application of OP-Amp, as inverting, non-inverting amplifiers, differentiation, Integratior, scal charger and voltage follower, Silicon controlled rectifier (SCR), Diac, Traic and UJT (Only qualitative study).

UNIT-IV THE INTEL 8080/8085 MICROPROCESSOR : Introcution, the 8085 pin diagram and functions, The 8085 architecture, addressing modes, the 8080/8085 instruction set, the 8080/8085 data transfer instructions, the 8080/8085 arithmetic instructions, the 8080/8085 logical instructions the 8080/8085 stack, I/O and machine controlled instructions.

UNIT-V PROGRAMMING THE MICROPROCESSOR : Machine and assembling languages simplified instruction set, Instruction set, arithmetic poeration, Instructions set logical operations, instruction set data transfer operations, instruction set branch operations, instructuion set-subroutine all and return operations, instruction set miscellaneous operations, writing a program, addressing modes, program branching, program looping using subroutines.

Programming the 8080/8085 microprocessor : Introduction straight-line programs looping programs, mathematical programs.

PAPER - II

(Paper Code-0929)

FUNDAMENTAL DATA STRUCTURE

UNIT-I Introduction to Data STructure : The concept of data structure, Abstract data structure, Analysis of Algorithm, The concept of list.

Stacks and Queues : Introduction to stack & primitive operation on stack, Stack as an abstract data type, Multiple Stack, Stacks application : infix, post fix, and Recursion, Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular Queue, Dequeue, Priority Queue.

UNIT-II Linked List : Introduction to the linked list of stacks, The linked list of queues, Header nodes, Doubly linked list, Circular linked list, Stacks & Queues as a Circular linked list, Application of linked list.

UNIT-III Trees: Basic Terminology, Binary Trees, Tree Representations as Array & Linked list, Binary tree representation, Traversal of binary trees : In order, Preorder & post order.

Application of Binary tree, Threaded binary tree, B-Tree & Height balanced tree, representation of B^+ & B* trees, Binary tree representation of trees, Counting binary trees, 2-3 Trees algorithm or manipulating 2-3 Trees.

UNIT-IV Searching & Sorting : Sequential Searching, Binary search, Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods.

UNIT-V Tables & Graphs : Hash Table, Collision resolution Techniques, Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs. Graph Traversal Depth first & Breadth first search, Spanning Trees, minimum spanning Tree, The basic, Greedy Strategy for computing Algorithm of Kruskal and prims.

TEXT & REFERENCE BOOK :

Fundamentals of Data structure : By S. Sawhney & Horowith
Data Structure : By Trembley & Sorrenson.

Data Structure Using Pascal : By Tannenbaum & Alugenstein

Data Structure : By lipschuists (Schaume's Outline Series Mcgraw Hill Publication)

Fundamentals of Computer Algorithm : By Ellis Horowitz and Sartaj Sawhney.

PRACTICAL WORK

1. The sufficient practical work should be done for understanding the date structure with C++.
2. The sufficient practical work must be performed on stacks queues linked list, trees etc.
3. All practical works should prepared in form of print outs and voluated while practical examination.

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INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	Agriculture and Food Microbiology	3 hrs.	50
Second	Fermentation Technology & Government Regulations	3 hrs.	50
	PRACTICAL Examination (including sessionals)	4 hrs.	(20+5) 25
	Viva-Voce Exam. based on "Summer Job-Training Report"		25

PAPER-I

(Paper Code-0930)

AGRICULTURE AND FOOD MICROBIOLOGY M.M. : 50

UNIT-I Soil fertility and management of agricultural soils. Influence of available nitrogen on soil-fertility. Importance of crop-rotation. Soil management. Management practices : Pesticides and their impact and effect on soil fertility.

UNIT-II Microbial diseases of crop plants with special reference to Wheat, Rice, Maize, Groundnut, Mustard, Grapes, Potato and Papaya.

UNIT-III Control of plant diseases. Chemical control of plant diseases. Biological Control- its mechanism and importance. Biopesticides. Concept of integrated pest management (IPM). Bacterial insecticides.

UNIT-IV Food spoilage mechanism, Spoilage of stored products, fruits and vegetables. Microbial spoilage of milk and meat. Food borne diseases.

UNIT-V Food preservation methods - Asepsis, Pasteurisation canning, dessication, low temperature, Anaerobiosis, filteration.

Chemical preservation of food - salt and sugar, organic acids. Use of SO_2, ethylene and propylene oxides, wood smoke.

PRACTICALS

1. Study of microbial diseases of crop plants.
2. Study of effect of fungicides and insecticides on microorganisms.
3. Study of antagonistic activities amongst microorganisms.
4. Study of fungal contaminants from stored agricultural products.
5. Study of food spoilage microorganisms from sweets and bakery products.
6. Study of effect of the preservatives on the growth of microorganisms.
7. Study of UV radiations on microorganisms.
8. Study of the effect of agrochemicals on soil inhabiting microorganisms.

RECOMMENDED BOOKS :

1. Modern Plant Pathology by Bilgramy and Dubey.
2. Food Microbiology by Frazier.
3. Microbiology by S.S. Purohit.
4. Microbiology by P.D. Sharma.
5. Agricultural Microbiology by Rangaswami.
6. Plant Pathology by R.S. Mehrotra.

29/7/12 29/7/12

PAPER-II

(Paper Code-0931)

FERMENTATION TECHNOLOGY AND GOVERNMENT REGULATIONS

M.M. : 50

UNIT-I Fermentation equipments and production process. Principal types of fermenters - The batch fermenters, continuous stirred tank fermenters, Tubular fermenter, The fluidised bed fermenter, Solid State fermenters. Computer control of fermentation process. Strain improvement process.

UNIT-II Industrial production of organic acids - Lactic and citric acid.
Enzymes - amylase, protease and amino acids - L-lysine and glutamic acid.

UNIT-III Production of alcohol, wine, beer and acetic acid.
Production of antibiotics - Penicillin and Streptomycine.
Industrial production of vitamins - Vitamin B12 and Riboflavin.

UNIT-IV Importance of microorganisms in dairy industries. Production of cheese, Butter milk; and in bakery industries - leavening of bread, Indian fermented foods. Fungi and bacteria as a source of single cell proteins (SCP) and proteins.

UNIT-V Role of international organisation in biotechnology. Government programmes for biotechnology development. Government regulations of recombinant DNA research. Hazardous industrial wastes, Mycotoxin hazards in the production of fungal products. Regulations for disposal of biohazardous materials. Patenting of the products in Industries.

PRACTICALS

1. Measurement of production of citric acid by Aspergillus niger.
2. Measurement and production of alcohol by yeast.
3. Demonstration of Transformation of steroids.
4. Demonstration of IAA production by microbes.
5. Demonstration of enzyme production by microorganisms.
   (a) Amylase (b) Cellulase
6. Demonstration of mushroom cultivation.

RECOMMENDED BOOKS :

1. Industrial Microbiology by L.E. Casida.
2. Fermentation Technology by Whittakar.
3. General Microbiology, Vol. II, by Powar and Daginawala.
4. Molecular Biology and Biotechnology by H.D. Kumar.
5. Elements of Biotechnology by P.K. Gupta.

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ELECTRONICS

	Max.M.	Min.M
Paper-I Power Electronics, Microprocessors and IT Fundamental's	50	33
Paper-II Communication Systems	50	
Paper-III Practicals and Project	50	17

PAPER - I

(Paper Code-0911)

POWER ELECTRONICS, MICROPROCESSORS AND IT FUNDAMENTAL'S

UNIT-I Comparative study of semiconductor power Devices : Power Diodes, Power Transistors, Unijunction Transistor, Silicon controlled Rectifier, Diac and Triac. Structural Description and working of Unijunction Transistor (UJT), Characteristic curve, Use of a UJT as a Relaxation oscillator.

Description and working of a DIAC, Characteristic curve.

Description and working of a Triac, Characteristic curve, Triac as a switch. Silicon controlled Rectifier : Description of the structure and idea of doping profiles of different layers, Two Transistor model analysis of SCR, Voltage current Characteristics, Forward and Reverse Blocking states; Triggering mechanisms and methods of turn on, turn off mechanism.

UNIT-II 8085 up Instruction Sets and Programing of 8085 microprocessor : Logic 8 bit Instructions of 8085 Data Transfer (copy) Instructions, MOV, Arithmatic Instructions (ADD, ADI, SUB, SUI, INR, DCR), Logic operations : ANA,

ANI, ORA, ORI, XRA, XRI, Branch Operations : Unconditional and Conditional Jump Instruction, Rotate Operations : RLC, RAL, RRC, RAR, 16 Bit Arithmatic and Logical operations.

Use of Instruction set to make following programs.

(i) Data Block Transfer.

(i) To Arrange a Series in Assending and Decending Order.

(i) Largest Number Finding.

(iv) To Carry out simple arithmatic operations : Addition, Division Multiplication, Subtraction.

UNIT-III Programmable Interface Devices : Internal Architecture and pin out diagram of the 8155/8156 and 8355/8755 Multipurpose Programmable Devices, The 8279 Programable kayboard/display interface.

Interfacing Data Converters : Digital to Analog (D/A) converter, Analog to Digital (A/ D) converter.

UNIT-IV Information Technology :

Information theory - Introduction information in communication system, measurement of information, the binary digit (bit).

Data sets and their connection requirements, Modem : Classification, modes of modem operation, modem interconnection, modem data transmission speed. Internet basics : Basic information about Http, WWW, HTML, shell and TCP/IP account, Browsers - Netscape and Internet explorer, e-mail.

UNIT-V Communication Technology :

LAN, WAN and MAN, wireless network, Internetwork, network topology, OSI and TCP/ IP reference models, comparision between them and their criticism. Details about Physical layer : magnetic media, twisted pair (UTP and STP), coaxial cable, fiber-optic cable Basic idea about ISDN.

REFERENCES :

1. Power Electronics : M.H. Rashid Prentice Hall of India, New Delhi.
2. Microprocessor Architecture Program and Applications : R.S. Gaonkar Penram Publication, Mumbai.
3. Computer Network : A.S. Tanebaum, Second Edition Prentice Hall of India Pvt. Ltd.
4. Introduction to Microprocessors: A.P. Godse, VTU Publishers, Pune.
5. Power Electronics : Alok Jain Penram Publishers, Mumbai.
6. Microprocessors & Interfacing : Douglas V. Hall Tata Mcgraw Hill.

PAPER - II

(Paper Code-0912)

COMMUNICATION SYSTEMS

UNIT-I Analysis of passive filters (low pass, band pass and high pass), elementary idea of active filters-Butterworth and Cbevyshev response) Noise : Thermal noise, shot noise, Partition noise, low fequency and transit time noise, Generation and recombination noise, equivalent noise resistance, signal to noise ratio, noise factor, noise temperature.

UNIT-II **Modulation :** Principle of modulation, wave spectra and effect of filtering an complex wave : Amplitude modulation; frequency spectrum of AM, average power average voltage, modulation index for multiple sine waves, linear and square modulators, collector modulator, balance modulator, single side band (SSB) generation/method, diode detector, advantages and disadvantages of SSB over DSB AM : SSB detection, Transmitters and Receivers : Superheterodyne receiver, AM Transmitters.

UNIT-III **Angle Modulation :** Elements of frequency and phase modulation frequency spectrum of FM waves, inter system comparisions (FM and AM); Generation of FM, direct and indirect methods; Angle - Modulator circuits, varactor diode and FET modulators; Foster Seelay discriminator and ratio detector.

UNIT-IV **Pulse Modulation :** Pulse Modulation, pulse transmission, pulse amplitude modulation, time division multiplexing, pulse time modulation, pulse width and pulse position modulation, digital filtering, pulse code modulation; Block diagrams of PCM transmission and receiving circuits.

UNIT-V **Television engineering :** Scanning process, characteristics of human eye, aspect ratio, persistence of vision and flicker, resolution and video bandwidth, interlaced scanning, blanking, synchronizing and equalizing pulses, Vestigial side band signal, standard channel characterstics, TV camera tubes Image orthicon and vidicon; Block diagram of TV transmitter and receiver.

Three colour system, luminance and chrominance signal, colour TV camera, Shadow mask, Trinitron and in line colour picure tubes.

REFERENCES :

1. Electronic Communication Systems : George Kennedy, Tata Mcgraw Hill.
2. Principles of Communication Systems : Taub & Schilling TMH
3. Communication Systmems : Simon Haykin, Mcgraw Hill.
4. Monochrome & Color Television : R.L. Gulati, New Age International, New Delhi.

PAPER - III

PRACTICALS AND PROJECT

A student is required to do atleast 12 experiments and a project work in the academic year.

The scheme of practical examination will be as follows :

(i) One experiment and Working and Demonstration of Project works - 5 : Marks

Experiment	-	20
Viva	-	05
Project work & Viva	-	15 (10+5)
Sessional	-	10
Total	**-**	**50**

1. Study of SCR characterstics.
2. Study of Diac and Triac characteristics.
3. Study of UJT Characterstics.
4. Study of UJT as a relaxation oscillator.
5. Study of AM generation and detection.
6. Radio Receiver measurments.
7. Study of low pass, band pass and high pass filters.
8. Study of FM using voltage controlled oscillators.
9. Study of DC choppers.
10. Study of Pulse code modulation.
11. Study of electronic ragulation of D.C. & A.C. Motors.
12. Any four experiments on microprocessors.

NOTE : Other experiments of equal standard may also be set.

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ANTHROPOLOGY

PAPER-I

(Paper Code-0919)

"FUNDAMENTALS OF HUMAN GENETICS & HUMAN GROWTH"

AIM- The aim of this paper is to introduce the students the basics of Human Genetics and Human Growth.

UNIT-I Human Genetics : History, aims and scope. and its application to human society Cell division : Mitosis and Meiosis. Mendelism, Chromosomes ; Normal and Abnormal chromosomes. Genes, concept of DNA & RNA. Types of Inheritance : autosomal, (Dominant and Recessive). Sex linked Inheritance.

UNIT-II Concept of Race. Formation of Racial groups. Criteria for racial classification. Racial elements in India. Major stocks of the world and their broad sub divisions.

UNIT-III Types of twins and their importance in genetic investigation. Inheritance of ABO Blood groups, P.T.C., Colour blindness and dermatoglyphics. Genetic councelling, Eugenics. Population Genetics.

UNIT-IV Definition and scope of Human growth. Methods of studying human growth and Development. Ageing, Nutritional requirement for normal growth. Common nutritional disorder (Protein, Fat, Carbohydrates, Mineral, Vitamin).

UNIT-V Ecology : definition and scope. Varieties of human ecosytems. Environmental Population. Definition, nature and scope of biological demography. Demographic Profiles : Fertility, Mortality, Morbidity.

RECOMMENDED READINGS :

1. AgrawalS.N. : India PopulationProblems
2. Bogue : Principles ofDemography
3. Bresler : HumanEcology
4. GranandShamir : Methods of Research in HumanGrowth
5. Hari.I. : Biochemical GeneticsMan
6. Harrison.A.E.(editor) : HumanBiology
7. Phyllis and Home,P.S. : Basic nutrition in health &disease
8. Race, R.R. &SangerR. : Blood Group inMan
9. SternC. : Principles of HumanGenetics
10. Tanner,J.M. : HumanGrowth
11. Theodarson : Studies in HumanEcology
12. WalsonandLowry : Growth and Development ofChildren
13. WinchesterA.W. : Principal ofGenetics
14. रधुवंशी अरूण एवं चन्द्रलेखा : पर्यावरण प्रदूषण।
15. Sinnot, Dunn & Dozansly : Principal of Grntics

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PAPER-II

(Paper Code-0920)

THEORIES IN SOCIAL CULTURAL ANTHROPOLOGY

AIM : The main aim of this course is to introduce the student about the basic pricinciples and Theories of Social cultural Anthropology to-provide preliminary understatnding of various theoretical models evolved by Social and Cultural Anthropology.

UNIT-I The contributions made by the following Anthropologists to Social-Cultural Anthropology.

(I) E.Durkheim, (II) F. Boas, (III) R. Redcfield, (IV) A. L. Kroeber, (V) S.C. Dube, (VI) M.N. Shrinivas, (VII) L.P. Vidyarthi.

UNIT-II Evolution: Biological and cultural Evolutionism; classical Evolutionism; E.B. Tylor, L.H. Morgan.

Neo - Evolutionism; jLeslie white, Gordon childe.

Culture traits, Culture Complex, Culture Area, and Culture focus.

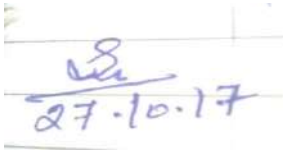
Diffusion of Culture : British diffusionist : Genrman - Austrian diffusionist (Kuttre kriese American diffusionist (Culture Area).

UNIT-III Function and structure: Functionalism (Malinowski) and Structure Functionalism (Redcliffe Brown) Structuralism (Levi strauss).

UNIT-IV Personality : Basic personality and Model personality.

Culture pattern : Configurationalism (Ruth Benedict). Anthropological study of National character.

UNIT-V Feild work tradition in Anthropology Major tools of Research: Schedule, Questionaire, Participant observation, interview, case study, Geneological Method. The main bases of Anthropological Methods: Historical Method, Comparative Method and Functional Method.



PAPER-III

PRACTICAL

Obejctive : The main of this practical coures is to introduce the student about the tools and Method, analysis & statistical methods used in Human Biology. Laboratory Procedures in blood grouping and dermatoglyphics would give confidence in Dealing with all the applied dimensions they process.

PART-I : Somatometry :

(a) Measurements on body :
(i) Height vertex, (ii) Height tragus, (iii) Suprasternale height, (iv) Biacromial Breadth, (v) Bi-illioncristal breadth, (vi) Tibial Height, (vii) Upper extremity Length,
(viii) Sitting height, (ix) height dactylion, (x) Body weight.

(b) Head and Face Measurement :
(i) Morphological upper facial length.
(i) Physiognomic upper facial length.
(i) Morphological facial length.
(iv) Bizygomalic breadth.
(v) Max head length
(vi) Max head breadth
(vii) Nasal length
(viii) Nasal breadth

(c) Indices :
(i) Cephalic Index
(i) Nasal Index
(i) Facial Index

PART-II Genetic Traits :

ABO blood group ; colour blindness, PTC taste sensitivity, Dermatioglyphics, Methods of taking finger and palm prints and their analysis.

PART-III Statistics

Mean, Median, Standard deviation, X^2 test.

BOOKS RECOMMENDED :

1. Basin M.K. and I.P. Singh : Anthropometry
2. Cummins H. and Midlo C. : An Introduction of Dermatoglyphics
3. Dunsford and Bowley : Blood Group Techniques
4. Fisher R.S. : Statistical methods for Research Workers
5. मित्रा, मिताश्री : प्रायोगिक मानव विज्ञान भाग–02
6. Olivi : Practical Anthropology

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27.10.17

ELECTRONICS EQUIPMENT MAINTENANCE

	Max. Marks	Min. pass Marks
Paper - I Trouble shooting and maintenance of audio and video Equipments.	50	17
Practical	50	17
Project	50	17

PAPER-I

(Paper Code - 0913)

TROUBLE SHOOTING AND MAINTENANCE OF AUDIO AND VIDEO EQUIPEMENTS

UNIT-I REMOTE CONTROL AND SPECIAL CIRCUITS:

Remote control, electromechanical control system, electronic touch tuning frequency synthesiser, TV tuner, automatic fone tuning (AFT), booster emplifier, automatic brightness control, instantious circuitry, picture tube boosters.

ALIGNMENT AND SERVICING EQUIPMENTS :

Antistatics and low leakage multimeters, soldering Iron, Vacuum tube voltmeter (VT VM) Cathode Ray Oscillouscope (CRO) single Generation Video pattern Generator Coulor IIur Generation Vector Scope, High voltage probe Cable connectors shielding and Graunding.

UNIT-II TELEVISION:

Trouble shooting procedure, troubles shooting monochrome receivers, servicing of various functional blocks, trouble, shooting colour receivers, servicing circuit modeles, saprets precautions in television servicing.

TELEVISION CAMERA TUBES : Basic principles and maintenance recording.

UNIT-III BLOCK DIGRAM OF VCR :

Requirement of VCR, retaining video drums, helical scan, guard band, frequency response, serva systems, tape tension regulatar, real servo, system control. Different formats, the quacruplex format, type B segmented format, type C formet, the U matic format, the 1/2" V.H.S. format, 3-Max system.

UNIT-IV SINGAL PROCESSING, CHROME PROCESSING :

Colour under technique, recovery of down converted chrome signals, luminance processing. frequency modulation, deviation and band width, autometic gain correction, limited, pre-enphasis, replay of luminance signal, Y/C delay, drop out compensator, block diagram of main requirements, zero guard band system, turners and modulators, the modulator. Servo mechanisms and system control : Recording, playback, tracking, capstan servo system control, loading and tereading and play mode, record mode, auto stops, counter, audio video muting.

UNIT-V CARE OF MECHANICAL SYSTEM:

Cleaning of head and tape path. Lubrication, replacement of parts, replacement of audio CTC head, replacement of video drum, dihedral error, table height, tape tension. drive toungue stop brenks.

ELECTRONIC SYSTEM ALUGNMENTS:

Instruments, fault finding the power supply, free funning speed the servo system, tracking, video system, playback section alignment, amplifier balance and gain, luminance signal adjustment, D.O.C., F.M. demodulator, limited balance, carrier leak, noise canceller, colour processing, up conversion automatic colour correction, autometic face connection recording, luminance, synctip or clamping frequency, deviation set, white clip, chrominance, summary.

NEW TECHNOLOGIES:

Industrial aspects of consumer electronics, jigs and fixture, quality control/ management, production techniques, business cycle new technologies, compact disc, laser disc.

PAPER - II

(Paper Code - 0914)

PRACTICAL

A student is required to do atleast 2 experiments in an acadmic year, and one month summer Training. The scheme of practical examination will be as follows :

(1) On experiment of 3 hours duration and one month summer Training.

(2) The marks for summer training will be awarded by the teachers teaching the students on the basis of the certificate issued by the external supervisor of the summer training.

Marks		
Experiment	25	Marks
Sessional	10	Marks
on month summer training	15	Marks
Total	**50**	**Marsk**

Orientation and connection to TV antenna. Knowledge of booster connection and replacement. Knowledge of bloon Unit - different types (for different TV sets) and replacement of ballon, Replacement of front end.

Power supply and resistance cold tests. Voltage measurement at different points.

Horizantal and vertical oscilator checking and testing using CRO.

To see and read circuit diagram and to identity (Locate) various block on p/s, H and V deflection, video amplifier, audio, section, chroma section, IF section, tuner, tube and direction yokes (connecting and

adjustment).

Audio section wave form testing step by step-sound separator, sound take off from IF section and tenonwards to detector amplifier, IF alignment and loud speaker. (intercarrier sound take off).

If stage testing : IF alignment, tunner and band select.

Chroma processor : testing singals at various IC's.

Remote control studies-range, direction various, controls, IR transmitter and receiver, coding of signal.

Fault finding: cold testing and voltage testing of various parts. (Revision of parts

BIOTECHNOLOGY

PAPER - I

GENERAL BIOTECHNOLOGY

Plant, Environment and Industrial Biotechnology

Time : 3 Hrs **MM-50**

UNIT-I Plant cell and tissue culture : General introduction history, scope.
Application of tissue culture
Concept of cellular differentiation.
Agro bacterium. Ti and Ri plasmid.
Bt gene. Molecular marker (RFLP, RAPD), edible vaccines.

UNIT-II Organogenesis, Embryogenesis. Protoplast isolation and fusion.
Germplasm storage and Cryopreservation.
Anther and Ovary culture.

UNIT-III General introduction and scope of environmental biotechnology.
Environmental pollution and its type.
Control of pollution through biotechnology, Wastewater treatment:- Physical, Chemical, and Biological.

UNIT-IV Biofertilizer, Biopesticides, IPR.
Global environmental problem- General introduction, Ozone depletion. Acid rain.
Green house effect.

UNIT-V Bioreactors and its type.
Fermentation (Lactic acid, alcohol).
Maintenance of Industrial microorganisms.
Food technology- introduction, canning. packing and food preservation.

PAPER – II

IMMUNOLOGY

Time : 3 Hrs **MM-50**

UNIT-I Immunology - General Concept, history and Development.
Immune system and immunity, Organization of Immune system.
Antigen - Antibody and its type.

UNIT-II Cell involved in immune system. Type and cells. Basic structure and function.
Cytokines.
Cell mediated immunity Interferons. Hypersensitivity.

UNIT-III Antigen - antibody interaction. Principles and types.
Immunohaematology - General concept. Blood group system. Rh factor. medical application of blood groups.

UNIT-IV Origin and diversity in immune system.
Effectors mechanisms.
Immunity of infection diseases monoclonal Antibodies.

UNIT-V Autoimmune diseases. Hemolytic anemia. Rheumatoid arthritis. Insulin dependent diabetes. Myasthenia gravis. Organ transplantation. Immunodeficient diseases. Cancers. AIDS.

PRACTICAL

EXPERIMENTS

Plant :

1. Sterilization of plant materials.
2. Preparation of Tissue culture media.
3. Plant tissue culture by plant parts.

Environment :

1. Determination of total dissolved solids of water.
2. Determination of DO, BOD, COD of water.
3. MPN Test.

Industrial :

1. Food preservation techniques.
2. Application of biopesticieds on microorganisms
3 Production of Citric acid by microorganisms.

Immunology :

1. Blood grouping in relation to Antigen Antibody interaction.
2. Rh factor determination.
3. Widal Test
4. VDRL Test.
5. Double diffusion experiment
6. ELISA Test

BIOTECHNOLOGY

Time : 4 HRS **MM-50**

Scheme	**Marks**
1. Experiment based on Paper - I	
(i) Plant tissue culture	08
(i) Environment / Industrial	07
2. Experiment based on Paper - II	15
3. Spots 05 (based on paper I & II, at least two spots from each paper)	10
4. Viva-voce	05
5. Sessional	05
Total	**50**

BOOKS-

1. A test Book of Biotechnology : Indu Shekher Thakur - I.K. International Pvt. Ltd., New Delhi.
2. Biotechnology (Fundamentals and Applications) : S.S. Purohit - Agrobios (India), Jodhpur.
3. Fundamentals of Microbiology and Immunology : Ajit Kr. Banerjee, Nirmalya Banerjee - New central Book Agency (P) Ltd., Kolkata.
4. Plant Biotechnology : R.S. Chawla - Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Plant Biotechnology : B.D. Singh - Kalyani Publication, New Delhi.
6. Biotechnology : Fundamental & Appliction : S.S. Purohit
7. Immunology : J. Kubey et al.
8. Immunology : Roitt et al.
9. Fundamental of Immunology : W. Paul.
10. Plant Tissue culture : Rojdov
11. Plant Tissue Culture (Practical) : H.S. Chawla.

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BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a. Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitu-tion rexperiment.

b, Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c. Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d. Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and there.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a. Secondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b. Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c. Nucleic acid hybridization : Cot value and satellite DNA.

d. Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a. DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA poly-merases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

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b. TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse tran-scriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a. Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b. Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c. Regulation of gene Expression in prokaryotes : Enzyme induction and repression, operon concepts, Lac operon, Trp operon.

UNIT-V MUTATION AND REPAIR

a. Mutation: Molecular basis of mutation, types of mutation, e.g. transition, transversion frame shift, insertion, deletion, suppresser sensitive, germinal and somatic, backward and forward mutations, true reversion and suppresion, dominant and recessive mutation, spontaneous and induced mutations = Ledergerg's replica plating experiment.

b. Mutagenecity testing : Correlation of mutagenecity and carcinogenicity : Ames testing, Random and site directed mutagenesis.

c. DNA Rapair : UV repair system in E.Coli, Significance of thymine in DNA.

RECOMBINATION AND TECHNOLOGY

Restriction endonucleases, brief discussion of steps in DNA cloning. Application of recombinant DNA technology.

Books:

1. Biochemistry J David Rawn, Neil Patterson Publisher, North Carolina.
2. Molecular biology of the gene JD Watson, NH Hopkins, JW Robert, JP Stretz, AM Weiner, Freeman San Francisco.
3. Fundamental of biochemistry by D Voet and CW Pratt, John Wiley & Sons, NY.
4. Text book of biochemistry Thomas M Devin, John Weley & Sons, NY.

PAPER - II

NUTRITIONAL, CLINICAL & ENVIRONMENTAL BIOCHEMISTRY

M.M.-50

UNIT-I NUTRITIONAL BIOCHEMISTRY

Nutrition and dietary habits

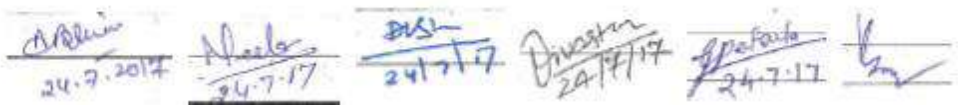
a. Introduction and definition of foods and nutritiori. Factors determining food acceptance, physiological, energy, body building (growth and development).

Regulation of body temperature. Physiology and nutrition of carbohydrates, fats, proteins and water. Vitamins A,D,E,K, Vit B-Complex and Vit C and minerals like Ca, Fe and Iodine and their biological functions. Basic food groups : energy giving foods, body building foods and protective foods.

b. Composition of balanced diet, recommended dietary allowances (RDA) for average indian, locally available foods, inexpensive quality foods and food stuff's rich in mor ethan one nutrients. Balanced vegetarian diet, emphasis on nutritional adequacy.

UNIT-II NUTRITATINE AND CALORIFIC VALUES OF FOODS

a. Basic concepts of energy expenditure, units of energy, measurement of energy expenditure by direct or indirect calorimetry, calculation of non protein RQ with respect to carbohydrates and lipids. Determination of heat production of the diet. The basal metabolism and method of measuring basal metabolic rate (BMR) energy requirements during growth, pregnancy, lactation and various physiologi-cal activities. Calculation of energy expenditure of average man and women.



b. Specific dynamic action (SDA) of foods, naturitive value of various kinds of foods generally used by Indian population. Planning of dietary regimes for infants, during pregnancy and old age. Malnutrition, its implications and relationship with dietary habits and prevention of malnutrition pecially protein-calories malnutrition (Kwashiorkor and Marasmus) by improvements of diets. Human milk and its virtues, breast vs formulated milk feeding. Food preservation standards, food adulterations and precautions, government regulations on poreservation and quality of food.

UNIT-III CLINICAL BIOCHEMISTRY

i) Basic concepts of clinical biochemistry

a. Definition and scope of clinical biochemistry in diagnosis, a brief review of units and abbreviation used in expression concentration and standard solutions. Quality control. Manual vs automation in clinical laboratory.

b. Collection and preservation of biological fluids (blood, serum, plasma, urine and CSF) Chemical analysis of blood, urine and CSF. Normal values for important constitutes (in SI units) in blood (plasma / serum), CSF and urine, clearance tast for urea.

UNIT-IV (i) CLINICAL ENZYMOLOGY

a. Definition of functional and non- functional plasma enzymes. Isozymes and diagnostics Tests. Enzymes pattern in health and diseases with special mention of plasma lipase, amylase, cholinesterase, alkaline and acid phosphatase, SGOT, SGPT, LDH and CPK.

b. Functional tests of kidney, liver and gastric fluids.

(i) Hypo and hyper-gylcemia, glycogen storage diseases, lipid mal-absorption and steatorrhea, sphingolipidosis, role of lipoproteins. Inborn errors of amino acid metabolism alkaptonuria, phenyl-ketonuria, albinism, gout and hyper-uricemia.

UNIT-V ENVIRONMENTAL BIOCHEMISTRY

(i) Air pollution : Particulate matter, compounds of carbon, sulphur, nitrogen and their interactions, methods of their estimation, their effect on atmosphere.

(ii) Water pollution : Types of water boides and their general characteristic, major pollutants in domestic, agricultural and industrial wastes, methods of their estimation, effects of pollutants on plants and animals, treatment of domestic and industrial wastes, solid-wastes and their treatment.

Books :

1. Modern nutrition in health and diseaser by Whol and Goodhart.
2. Human nutrition and Dietetics-S. Davidson and passmore-ELBS Zurich.
3. Tietz fundamental of clinical Chemistry by Cart A Burits & ER Ashwood Saunders WB Co.
4. Leacture Notes on Clinical Biochemistry-LG Whitby, AF Smith, GJ Beckett.

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a. Separation of proteins by column chromatography. b. Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A.(Economics) Semester Exam

UNDER

FACULTY OF SOCIAL SCIENCE

Session 2020-22

(Approved by Board of Studies)
Effective from June 2020

डॉ॰ वीणा अग्रवाल डॉ॰ डी॰ पी॰ चौबे श्रीमती सुशीला शर्मा डॉ॰ सुधा बाखला डॉ॰ रोहण प्रसाद

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

SYLLABUS FOR UNIVERSITY TEACHING DEPARTMENT AND AFFILIATED COLLEGES IN P.G. CLASSES

M.A. in Economics: Semester Examination 2020-22

At post graduate level, candidates are required to study 15 papers in First, Second and Third semester (5 papers in each semester) and 04 papers in fourth semester examination. This is to be treated as the nineteen papers of the course structure. So there shall be 19 papers in the post graduate examination in Economics. Viva - voce examination be treated as a compulsory paper for M.A. fourth semester examination. Each paper shall carry 100 marks out of which 80 marks will be for theory paper and 20 marks for internal assessment. There shall be 2000 marks in M.A. Candidates shall have secure 36 percent marks in aggregate of all papers in order to pass the M.A. Examination. Examination and result shall be treated according to rules and regulations of ordinance no. 13.

M.A. SEMESTER-I and SEMESTER-II

PAPER	SEMESTER-I	Mark		SEMESTER-II	Marks	
		Theory	Internal Assessm - ent.		Theory	Internal Assessm-ent
PAPER-I	Micro Economics-I	80	20	Micro Economics-II	80	20
PAPER-II	Macro Economics-I	80	20	Macro Economics-II	80	20
PAPER- III	Statistical and Quantitative Methods	80	20	Research Methods & Computer Application	80	20
PAPER- IV	Indian Economy	80	20	Indian Economic Policy	80	20
PAPER- V	Industrial Economics	80	20	Labour Economics	80	20

M.A. SEMESTER-III and SEMESTER-IV

PAPER	SEMESTER-III	Mark		SEMESTER-IV	Marks	
		Theory	Internal Assessment		Theory	Internal Assessment
PAPER-I	Economics of Growth	80	20	Economics of Development & Planning	80	20
PAPER-II	International Trade	80	20	International Economics	80	20
PAPER-III	Public Finance	80	20	Public Economics	80	20
PAPER-IV	Environmental Economics	80	20	Economics of Social Sector	80	20
PAPER-V	Demography	80	20	Viva-Voce	100	--

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER – I

Micro Economics -1

Paper - I

Unit-I Introduction: - Concept of Equilibrium, Economic Models, Neo Classical Demand Analysis. Elasticity of Demand (Price, Income & Cross), Elasticity of supply.

Unit- II Indifference curve, Marginal Rate of Substitution. Income & substitution effect, Hicks and Slutsky theorem, Revealed preference theory. Hicks's Revision of Demand, Hicksian Consumer surplus.

Unit – III Theory of Production – Production function, The short period & long period production function, the law of variable proportion (isoquant approach), Marginal rate of Technical Substitutions, Returns to a factor and returns to scale. Expansion path, Cobb-Douglas Production function, CES production function.

Unit- IV Theory of cost and Revenue analysis, Perfect Competition - equilibrium of firm in Perfect Competition. Monopoly - short run and long run equilibriums, price discrimination under monopoly competition, monopoly control and regulation. Comparison between monopoly and perfect competition.

Unit – V Monopolistic Competition – price and output determination under monopolistic competition, Group equilibrium, theory of excess capacity. Oligopoly – non-collusive oligopoly model: The kinked demand curve. The collusive oligopoly – Cartels: joint profit maximization or perfect cartels, price leadership: the low cost price leadership model.

Text Books

1. Jhingan M. L. (2014), Advanced Economic Theory, Vrinda Publication, New Delhi
2. Jhingan M. L. (2014), Micro Economics , Vrinda Publication, New Delhi
3. Agarwal , A (2014), Micro Economic analysis , Sahitya Bhawan Publication, New Delhi

Reference Books

1. Kraps, David M. (1990) A course in micro economics theory -Princeton university press, Princeton.
2. Koutsayiannis; A (1979) modern Micro economics (2nd Edition), Macmillan press, London.
3. Layard, PRG and P.W. Watters (1978), Micro economic theory, McGraw Hill, New York.
4. San A (1999) Micro economics theory and Applications, Oxford University Press, New Delhi;
5. Stigler, G. (1996) Theory of Price (4th edition), Princeton Hall of India, New Delhi.
6. Varian, H (2000) Micro economics Analysis, W.W. Norten, New York.
7. Baumol W.J., (1982) Economic theory and operations Analysis, Princeton Hall of lndia, New Delhi.
8. Handersan, J.M. and R.E. Quandy (1980) Micro economics theory - A Mathematical approach, Mc Graw Hill New Delhi.
9. Hirshleifer, J. And A Glazer (1997), Price theory and Application, Prentise Hall of India, New Delhi.

डॉ० शिखा अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहन प्रसाद

SEMESTER – I

MACRO ECONOMICS -1

Paper – II

Unit – I National Income and Accounts – Concept of National Income and National Product, Problems of Measurement, Different forms of National Income Accounting – Social Accounting, Input Out-put Accounting, Flow of Funds, Balance of Payment – Accounting. Circular flow of Income – Two, Three and Four Sector Economy

Unit – II Classical Theory of Employment, Say's Law of Market, Principle of Effective Demand, Keynesian & Pigou Theory of Employment, Comparison of Classical and Keynesian Models. National Income Determination of Keynesian Model - Two, Three and Four Sector Economy.

Unit- III Consumption Function- Keynesian Psychological Law of Consumption, Short Run & long run Consumption Function. Theory of Consumption Function – Absolute Income Hypothesis, Duesanbery's Relative Hypothesis, Life Cycle and Permanent Income Hypothesis.

Unit –IV Investment Function- Marginal Efficiency of Capital and Investment. Saving and Investment Equality, Multiplier and its working, Accelerator and its working, Super- Multiplier. Supply of Money, Determinants of Money Supply, Measurement of Money supply, Control of Money Supply. High Powered Money, Money Multiplier.

Unit – V Demand for Money –Fisher and Cash Balance (Cambridge) Approach, Fundamental Equation of Keynes. Friedman's re-formulation of the quantity theory of money.
Post Keynesian Approach to Demand for Money- Patinkin, Baumol's, James Tobin, Friedman, and Gurley & Shaw's Approaches.

Text books

1 Sethi,T.T.(2008) Macro Economics, Laxminarayan Agrawal ,Agra.
2 Jhingan,M.L.(2010) Monetary Economics,Vrinda publications pvt.ltd.
3 Jhingan,M.L.(2000) Macro Economic theory,Vrinda publications pvt.ltd.
4 Shinghai G.C &Mishra J.P.(2013) Macroeconomic Analysis, Sahitya bhawan publication Agra.

डॉ० शिखा अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधना बाखला डॉ० रोहण प्रसाद

SEMESTER-I
Statistical and Quantitative Methods
Paper III

UNIT I - Skewness- Symmetrical and asymmetrical distribution, Measurement of Skewness- Karl Perason Bowley. Simple Correlation- Measurement of Correlation, Karl Pearson's Coefficient of Correlation & Spearmen's rank correlation. Coefficient of correlation by the method of least square. Probable Error & Standard Error in correlation, Coefficient of determination of correlation.

UNIT II - Regression Analysis, Regression and Correlation, regression lines & regression coefficient, regression equations, Simple regression analysis, Multiple regression analysis (Up to three variables only), Standard Error of the estimates of simple regression analysis.
Interpolation and Extrapolation- Method of Fitting a Parabolic Curve, Newton's Advancing Difference Method, Direct Binomial Expansion Method and Lagrange's Method.

UNIT-III - Association of Attributes- Meaning and types of association, Consistency of data, Methods of determining association, Methods of Comparison Proportion Coefficient of Association using Yule's method.
Probability theory- Meaning and definition, Permutation and Combination, Types of events, Measurement of Probability, Addition and Multiplication theorem, Conditional Probability.

UNIT IV - Index Number_ Construction of Index numbers, simple and weighed Index numbers, Fisher's Ideal Index number, Reversibility Test, Time Reversibility & Factor Reversibility, Chain Index No.

UNIT V - Time Series Analysis- Components of Time Series, Measurement of long-term Trend, Short period oscillation, semi-average method, moving average method, Graphical Presentation.

Reference

1. *Shukla, S.M. and S.P. Sahay – Quantitative method's Sahitya Bhawan Publications, Agra.*
2. *Agrawal, D.R., 'Quantitative methods. Vrinda Publications (P) Ltd.*
3. *Sancheti, D.C., 'Quantitative methods' Sultanchand and Sons, New Delhi.*
4. *Gupta, S.P. and others, "Quantitative Techniques." Sultanchand and Sons, New Delhi.*

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- I
INDIAN ECONOMY
Paper –IV

Unit – I Indian Economy: Meaning, basic characteristics and major issues of development of Indian Economy, GDP and National Income of India – Components and Structure of GDP, Role of Primary, Secondary and Tertiary Sectors in GDP, National Income and Per Capita Income, Growth Rates of GDP and Per Capita Income.

Unit – II Demographic Features of India – Size, Growth Rate, Sex Ratio, Age-Composition, Literacy and Density of Population, Migration, Rural-Urban Migration, Urbanization and Civic Amenities, Occupational Structure, National Population Policy, Demographic Features of Chhattisgarh State.

Unit – III Agricultural Development in Indian Economy – Agricultural Growth and Productivity, Causes of Low Productivity and Measures to Increase it, Agricultural Marketing and Warehousing, Institutional Structure- Land Reforms in India, The Green Revolution, National Agricultural Policy and Food Security in India, Rural credit in India, NABARD and its role in rural credit.

Unit – IV Industrial Development in India, Industrial Policies of 1956 and 1991, Public Sector Enterprises and their Performance, Privatization and Disinvestment, Small Scale Sector and Minor Medium Enterprises, Unorganized Sector and Informalisation of the Indian Economy and Knowledge Economy.

Unit – V Infrastructure- Infrastructure and Economic Development, Energy, Power, Transportation- Road, Railway, Water and Civil Aviation in India, Private Investment in Infrastructure: Outlook and Prospect, Concept of Social Sector and Social Infrastructure, Education, Health and Family Welfare.

Reference:-

1 Ahulwalia, I. J. and I. M. E. Litle (Eds.) 1999): India's Economic Reforms and Development (Essays for Manmohan Singh), Oxford University Press, New Delhi
2 Bardhan, P. K. (9th Edition) (1998): The Political Economy of Development in India, Oxford University Press, New Delhi.
3 Bawa, R.S. and Raikhy (Ed.) (1997): Structural Change in Indian Economy, Guru Nanak Dev University Press. Amritsar (PB).
4 Brahmananda, P. R. and V. R. Panchmukhi (9th Eds.) (2001): Development Experience in the Indian Economy: Interstate Perspectives, Bookwell, Delhi.
5 Chakravarty, S. (1987): Development Planning: The Indian Experience, Oxford University Press, New Delhi.
6 Dantwala, M. L. (1996): Dilemmas of Growth: the Indian Experience, Sage Publication, New Delhi.

डॉ० वीरेन्द्र अग्रवाल डॉ० डी० पी० चौबे श्रीमती सुशीला शर्मा डॉ० सुधा बाजपेयी डॉ० रोहण प्रसाद

SEMESTER- I
INDUSTRIAL ECONOMICS
Paper –V

Unit – I Concept and Organization of a Firm-Ownership, Control and Objectives of the Firm.Rationale of Industrialization: Agriculture and Industrialization – patterns, process, speed, Implications of Industrialization. Theories of Industrial location, Alfred Weber and Sergeant Florence Theory. Factors Affecting Industrial Localization.

Unit – II Industrial Productivity, Efficiency and Capacity. Industrial Policy in India, Role of Public and Private Sector industries in India. Recent Trends in Industrial Growth. Strategies for Industrial Growth, Regional Development of Industries.

Unit – III Owned, External and Other Components of Funds, Nature, Volume and Types of Institutional Finance – IDBI, IFCI, SFCs, SIDC, Commercial Bank.

Unit –IV Structure of Industrial Labour, Employment Dimensions of Indian Industry. Industrial Legislation, Industrial Relations, Exit policy and Social Security.

Unit – V Large scale industries:- Iron and Steel, Cement, Jute, Sugar , Paper industry . Development of Small-Scale and Cottage Industries in India.

Text books

1. Ahluwalia, I.J. (1985): Industrial Growth in India, Oxford University Press, New Delhi.
2. Barthwal, R.R. (1985): Industrial Economics, Wiley Eastern Ltd., New Delhi.
3. Chernilam, F (1994): Industrial Economics : Indian Perspective (3rd Edition), Himalaya Publishing House, Mumbai.
4. Desai, B. (1999): Industrial Economic in India (3rd Edition), Himalaya Publishing house Mumbai.
5. Kuchhal .S.C.: The industrial economy of India , Chaitanya publishing house.

Reference

1. Divine, P.J. and R.M. Jones et. At. (1976): An Introduction to industrial economics, George Allen and Unwin Ltd., London.
2. Government of India, Economic Survey (Annual)
3. Hay, D. and D.J. Morries (1979): Industrial Economics : Theory and Evidence, Oxford University Press, New Delhi.
4. Kuchhal, S.C. (1980) : Industrial Economy of India (th Edition), Chaitanya Publishing House Allahabad.
5. Reserve Bank of India Report on Currency and Finance (Annual).
6. Singh, A. and A. Sadhu (1988): Industrial Economics, Himalaya Publishing House

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- II
MICRO ECONOMICS-II
Paper –I

Unit – I Full Cost Pricing Theory – Hall & Hitch, Sales maximization model: Baumol's model (price-output determination of a product without advertisement and optimal advertising outlay), Managerial theories of the firm: Williamson's model of managerial discretion. Theory of limit pricing: Bains model.

Unit- II Theory of distribution: Marginal productivity theory of distribution (Marshall– Hicks version), Product Exhaustion theorem. NEO-Classical Approach of Distribution: relative share of labor and capital, technological progress and factor shares in income, determinants of rent, wages, interest and profit (Only modern Theory).

Unit- III Linear Programming and Game Theory (Geographical and Simplex methods).

Unit – IV Concept of Equilibrium: Static and Dynamic equilibrium, Partial and General Equilibrium. Walrasian Excess Demand.

Unit – V Welfare Economics – Introduction, Value judgment, Classical Welfare Economics- Pigovian welfare economics, Pareto optimal conditions. New welfare economics: Compensation principle of Kaldor - Hicks. Social welfare function: Bergson – Samuelson social welfare function, Arrow's impossibility theorem.

Text Books

1. Jhingan M. L. (2014): Advanced Economic Theory, Vrinda Publication, New Delhi
2. Jhingan M. L. (2014): Micro Economics , Vrinda Publication, New Delhi
3. Agarwal , A (2014): Micro Economic Analysis , Sahitya Bhawan Publication, New Delhi

Reference Books

1. Mansfield, E. (1997): Micro Economics (9th Edition), W.W. Norton and Company, New Delhi.
2. Ray, N.C. (1975): An Introduction to Micro Economics, Macmillan Co. of India Ltd., Delhi.
3. Ryan, W.J.L. (1962): Price Theory, Macmillan and Co. Limited, London.
4. Samuelson, P.A. and W.D. Nordhaus (1998): Economics, Tata McGraw Hill, New Delhi.
5. Stonier, A.W. and D.C. Hague (1972): A Textbook of Economic Theory, ELBS and Longman Group, London.

डॉ० शिखा अग्रवाल डॉ० डी.पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- II
MACRO ECONOMICS
Paper –II

Unit – I Theory of Inflation – Classical, Keynesian and Monetarist Approaches to Inflation, Semi And Full inflation, Theory of Structural Inflation, Stagflation, Control of Inflation.
Philips Curve Analysis – Short Run and Long Run Philip's Curve. The Natural Rate of Unemployment Hypothesis, Tobin's Modified Philip Curve.

Unit – II Business Cycles- Main Features of Business Cycles, Types of Business Cycle, measures to control business cycle. Theories of Business Cycles :- Hawtrey's Monetary Theory of Trade Cycle, Schumpeter's, Keynes, Hicks, Samuelson's, Friedman, Kaldor Model of Trade Cycle.

Unit – III Monetary Policy-Meaning of Monetary Policy, Instrument of Monetary Policy, Objective of Monetary policy, Limitations of Monetary Policy, Monetary Policy and Economic Development. Fiscal Policy – Meaning of Fiscal Policy, Instruments of Fiscal Policy, Objectives of Fiscal Policy, Fiscal Policy and Economic Growth, Effectiveness of Fiscal Policy, Monetarism Vs Fiscalism – The Debate, Similarities between Monetary Policies and Fiscal Policies.

Unit – IV IS-LM Model, The Product Market Equilibrium, The Money Market Equilibrium, Equilibrium of Product and Money Market, Merits and Demerits of IS-LM Curve, Extension of IS-LM Models With Flexible Prices and Labour Market.

Unit – V- The Rational Expectation Hypothesis: - Adaptive Expectations, Rational Expectations. The New Classical Macro - Economics, Policy implications of New Classical Macro- Economics. Supply side economics: - main features, policy prescriptions.

Text books

1. Sethi,T.T.(2009-10): Macro economics ,Laxminarayan Agrawal ,Agra.
2. Jhingan,M.L.(2008): Monetary Economics,vrinda publications pvt.ltd.
3. Jhingan,M.L.(2010): Macroeconomic theory,vrinda publications pvt ltd.
4. Shinghai G.C. & Mishra J.P. (2013): Macro Economic Analysis, Sahitya Bhawan Publication Agra.

Reference

1. Blackhouse, R. and A. Salansi (Eds.) (20()), Macroeconomics and the Real World (2 vols) Exford University Press, London.
2. Branson, W.A. (1989), Macroeconomics Theory and Policy, (3rd Edition), Harper and Row, New York.
3. Aornbusch, R and F. Stanley (1997), Macroeconomics, McGraw Hill, inc., New York
4. Hall, R.E. and J.B. Taylor (1986), Macroeconomics, W.W>Norton, New York.
5. Heijdra, B.J. and V.P. Frederick (2001), Foundations of Modern Macroeconomics, Oxford University Press, New Delhi.
6. Jha, R. (1991), Contemporary Macroeconomic Theory and Policy, Wiley Eastern Ltd. New Delhi.
7. Romer, DL. (1996), Advanced macroeconomics, McGraw Hill Company Ltd., New York.
8. Scarte, B.L. (1997), Cycles, Growth and inflation, McGraw Hill, New York.
9. Markeley, G. (1978), Macroeconomics Theory and Policy, macmillan, New York.

डॉ० शिखा अग्रवाल डॉ० डी.पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER - II
RESEARCH METHODOLOGY AND COMPUTER APPLICATION
Paper –III

Unit – I Research methodology and research methods, Research: Meaning, types of research, motivation of research, main stages of statistical research, primary and secondary data, methods of collecting primary data, secondary data-different sources, precautions while constructing questionnaire/schedule, editing of primary data.

Unit – II Sampling- Meaning and need for sampling, size of sampling, merits and limitations of sampling, sampling and non- sampling errors, sampling frame, how to judge the reliability of samples. Various methods of sampling. Sampling design- meaning and steps in sample design.

Unit – III Classification and tabulation of data- meaning and objectives of classification, types of classification, tabulation of data, parts of a table, types of tables. Processing and analysis of data- processing operations, some problems in processing, Elements/types of analysis.

Unit – IV Hypothesis: Meaning of hypothesis, basic concepts concerning testing of hypothesis, procedure for hypothesis testing, test of significance based on students 't' test, Chi-square test 'F' ratio test and Paired T test. Practical problems related to Students 't' test, Chi-square test, F ratio test and paired T test .

Unit – IV Computer: What is a Computer? Important characteristics of a computer, history of computer, different parts of a computer - hardware and software, various types of computer, main characteristics of a computer, elementary knowledge of INTERNET and MS office, role of computer in economic research.

Reference Books

1. Kothari, C.R.: Research Methodology
2. Sharma, Dr. Ramnath: Methods and Techniques of Social Survey and Research, Rajhans Publications
3. Bajpai, Dr. S. R.: Methods of Social Survey and Research, Kitab Ghar, Kanjpur-3.
4. मुखर्जी, रविन्द्रनाथः सामाजिक शोध एवं सांख्यिकी, विवेक प्रकाशन, जवाहर नगर, दिल्ली – 7
5. शुक्ला एवं सहायः सांख्यिकीय, साहित्य भवन पब्लिकेशन्स, आगरा

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- II
INDIAN ECONOMIC POLICY
Paper – IV

Unit – I Planning in India– Objectives and Strategies of Planning, Twelfth Five Year Plan, Development Strategy, LPG Model of Development, PURA- A Neo Gandhian Approach to Development, Developing Gross–root Organization: Panchayats, NGO's.

Unit – II Problem of Poverty and Inequality – The Concept of Poverty, Measurement and Estimation of Poverty in India, International Comparison of Poverty and Inequality of Incomes, Poverty Eradication Programmes, Causes of Failure to Remove Poverty.

Problem of Unemployment in India- Nature of Unemployment, Various Schemes to Reduce the Unemployment, Balanced Regional Development- Indicators, Causes, Changing Scenario and Policy Measures to remove Regional Disparity.

Unit – III Indian Finance System – An overview, Functions of the Reserve Bank of India, Commercial Banking system, Progress of Banking since 1969, RRBs, DFIs and NBFCs, Financial Sector Reforms in India, Stock Exchange in India, Composition of Indian Capital Market, SEBI and Capital market reform.

Unit – IV Foreign Trade of India- Importance of Foreign Trade for a developing Economy, Foreign Trade since 1991, Structure and Direction of Foreign Trade, Balance of Payments of India, Issues in Export Import Policies, External value of the Rupee and Foreign Exchange Reserves, FEMA, SEZs, Trade Reforms in India.

Unit – V WTO and its Impact on the Different Sector of Economy, Economic Reforms – Rational of Internal and External Reforms, Cooperative movement in India- Organization, Structure and Development of different types of Cooperatives in India.

Reference:-

1. Ahulwalia, I. J. and I. M. E. Litle (Eds.) 1999): India's Economic Reforms and Development (Essays for Manmohan Singh), Oxford University Press, New Delhi,.
2. Bardhan, P. K. (9th Edition) (1998): The Political Economy of Development India, Oxford University Press, New Delhi.
3. Bawa, R.S. and Raikhy (Ed.) (1997): Structural Change in Indian Economy, Guru Nanak Dev University Press. Amritsar (PB).
4. Brahmananda, P. R. and V. R. Panchmukhi (9th Eds.) (2001): Development Experience in the Indian Economy : Interstate Perspectives, Bookwell, Delhi.
5. Chakravarty, S. (1987): Development Planning: The Indian Experience, Oxford University Press, New Delhi.
6. Dantwala, M. L. (1996): Dilemmas of Growth: the Indian Experience, Sage Publication, New Delhi.

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- II
LABOUR ECONOMICS
Paper – V

Unit – I Labour Economics - Definition, Nature, Scope & Importance. Labour Market – Nature and Characteristics of Labour Markets in India .Supply of Labour - Labour force, factors affecting Law of Labour Supply. Demand for Labour – Labour productivity, Demand for Labour by Industrialist..

Unit – II Theories of labour market:- Classical Theory of labour, Marginal productivity theory of Labour Concept of wages – Real Wages , Nominal Wages, Factors Affecting Real wages , Theories of Wage Determination - Classical Theory, New Theory, The theory of Collective Bargaining.

Unit – III Theories of Labour Movement- Labour Unions in India, Rise and Growth of Labour Union, Achievements of Labour Unions. Structure and Pattern of Trade Union- Objectives, Growth, Achievements and Failures.

Unit – IV Labour Legislation in Indian Labour, Laws and Practices in Relation to International Labour Standards. State and Labour, State and Social Security of Labour, Concept of Social Security and its Evolution.

Unit – V Labour Welfare in India, Rural and Agricultural Labour in India, Child Labour, Female Labour, Concept of Industrial Peace, Settlement of Industrial Dispute, Second National Labour Commission.

Text books

1. Goyal, Sunil & Goyal, M.L.(2008): Labour Economics, R.B.S.A. Publications, Jaipur.
2. Saxsena, R.C.(2010): Labour Problems & Social Welfare, K. Nath and Company Publication, Meerut.
3. Singh, Dilip Kumar,(2008): Workers Participationin in Management and Industrial Relation, Rawat Publication, Jaipur & Delhi.
4. Singh, Usha & Singh, H.P.(2011): Child Labour in India :Problem and Solutions, Classical Publication ,New Delhi
5. Gupta, P.K.: labour economics , Vrinda publications .

डॉ० शिखा अग्रवाल डॉ० डी.पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER – III
ECONOMICS OF GROWTH
PAPER – I

Unit- I Economic Growth: Economic Growth and Development, Measurement of Economic Growth, Vicious Circle of poverty, Physical Quality of Life Index. Human development Index, Gender Development index, Gender empowerment measure, UNDP's Human Development Report 2015.

Unit-II The Concept of Capital Output Ratio, Input-Output Analysis, Project Evaluation and its methods and Cost–Benefit analysis, Shadow Prices.

Unit-III Theories of Growth:- Harrod-Domar model,Joan Robinson model, Mead's Neo -Classical Model, Solow Long- Run, Kaldor model of Distribution.

Unit- IV Approaches to Growth:- Kaldor model of Growth, The Pesinetti Model of Profit and Growth, The Models of Technical Change, The Golden rule of Accumulation model.

Unit- V Steady State Growth, Growth Accounting, The Friedman Model, The Mahalanobis Four Sector Model.

Text Books

1. Jhingan,M.L.(2008)31ST edition,: The economics of development and planning, Vrinda publication pvt.Ltd.
2. Shinghai G.C. & Mishra J.P.(2013): Macroeconomic Analysis, Sahitya bhawan publication Agra.
3. Mishra, J.P.(2012): Economics of Growth and development, Sahitya bhawan publication Agra.

Reference Books

1. Hajela P.D. (1998): Labour Restructuring in India: A Critique of the New Economic Policies, Commonwealth Publishers, New Delhi.
2. Jhabvala, R. and R.K. Subrahmanya (Eds.) (2000): The Un-organised Sector : Work Security and Social Protection. Sage Publication, New Delhi.
3. Lester, R.A. (1964): Economics of Labour (2nd Edition), Macmilan, New York.
4. McConnell, C.R. and S.L. Brue (1986): Contemporary Labour Economics, McGraw-Hill New York.
5. Papola, T.S.,P.P. Ghosh and A.N. Sharma (Eds.1993): Labour, Employment and Industrial Relations in India, B.R. Publishing Corporation, New Delhi.
6. Rosenberh M.R. (1998): Labour Markets in Low income Countries in Chenery, H.B. and T.N. Srinivasan, (Eds.) The Handbook of Development Economics, North-Holland, New York.
7. Venkata Ratnam, C.S. (2001): Globlization and Labour- Management Relations Dynamics of change, Sage publications/ Response Books, New Delhi.

डॉ० पारुल अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहन प्रसाद

SEMESTER- III
INTERNATIONAL TRADE
Paper – II

Unit – I Theory of International Trade– Meaning and Distinguishing Features of Inter-regional and International Trade, The Comparative Cost Theory, Refinements of the Comparative Cost Theory, Opportunity Cost Theory, Theory of Reciprocal Demand.

Unit – II Modern Theory of International Trade, Factor Price Equalization, Theorem of International Trade, Stopler Samuelson and Rybezynski Theorems.

The Terms of Trade– Concepts, Determination of Terms of Trade, Factors affecting Terms of Trade,Terms of Trade & Economic Development, Its Empirical Relevance and Policy Implications for Less Developed Countries, Terms of Trade & Welfare Implications.

Unit – III The Theory of Intervention– Tariffs, Quotas, and Non-tariff Barriers, Economic Effects of Tariff and Quotas on National Income, Output, Consumption, Price, Employment, Terms of Trade & Income Distribution, The Stopler – Samuelson Theorem of Tariff on Income Distribution, The Learner's Paradox.

Unit – IV Balance of Payments– Meaning and components, Equilibrium and Disequilibrium in the BOP, Measures to Correct the Adverse BOP, Adjustment Mechanisms of BOP, Devaluation- The 'J' curve effect, Marshall-Lerner's Conditions under Devaluation, Expenditure Reducing and Expenditure Switching Policies and Direct Control.

Unit – V Income Adjustment- Foreign Trade Multiplier, Foreign Repercussion or Back-Wash Effect, Foreign Exchange Rate- Spot and Forward Exchange Rates, Fixed and Flexible Exchange Rates- their Merits and Demerits, Hybrid Exchange Rate, Floating Rate of Exchange, Managed Floating System.

Reference:-

1. Bhagwati, J. (Ed). (1981): International Trade, Selected readings, Cambridge, University Press, Massachusetts.
2. Carbough, R.J. (1999): International Economics, International Thompson Publishing, New York.
3. Chacholiades, M. (1990): International Trade: Theory and Policy, McGraw Hill, Kogakusha, Japan.
4. Dana, D. S. (2000): International Economics: Study Guide and Work Book, (5th Edition), Routledge Publishers, London.
5. Dunn, R. M., and J. H. Mutti (2000): International Economics, Routledge, London.
6. Kenen, P.B. (1994): The International Economy, Cambridge University Press, London.
7. Kindleberger, C. P. (1973): International Economics and International Economic Policy A Ready, McGraw Hill International, Singapore.
8. Krugman, P. R. and M. Obstfeld (1994): International Economics : Theory and Policy, Glenview, Foresman.

डॉ० निशा अग्रवाल डॉ० डी० पी० चुरे श्रीमती सुशीला शर्मा डॉ० सुधा बाकला डॉ० रोहन प्रसाद

SEMESTER- III
PUBLIC FINANCE
Paper – III

Unit – I Definition, Nature and scope of Public Finance, Role of Public Finance in developing Countries, Principles of Maximum Social Advantages. Taxation– features of a good tax system, Objectives of Taxation, Principles of Taxation, canons of Taxation, Shifting, Effects and Incidence of Taxation. Impact of Tax under Laws of Returns and Perfect Competition.

Unit – II Public Expenditure:- Meaning and Scope, Different Forms of Expenditure, Canons of Public expenditure, Structure and Growth of Public Expenditure in India. Trends in Central Government Expenditure. Economic Effects of Public Expenditure on Production and Distribution. Public Expenditure and Economic Growth.

Unit – III Public Revenue:- Meaning, classification, sources, principles and effects of public revenue. Classification of taxation: - Indirect & Direct Tax, Goods and service tax GST) New Direct tax, Central Excise, Custom Duties, Taxes on Land and Agriculture, Value Added Tax, Modvat, Service Tax. Taxable Capacity.

Unit – IV Public Debt– Meaning and Objectives of public debt, Different Sources of Public Debt, Redemption of Public Debt. Principle of Public Debt Management, Growth of Public Debt in India, Burden of Public Debt.

Unit – V Budget– Meaning, Objectives, Different forms of Budget, Budgetary Process in India, Kinds of Budget– traditional Budget, Performance Budget, Zero Based Budget, Out-come Budget, Gender Budget. Budget Theory– Classical Viewpoint (Balance Budget), Modern View Point (Imbalanced Budget.)

Text Book

1. Lekhi, R.K.,(2014): Public Finance, Kalyani Publication Ludhiana New Delhi
2. S.K., Sing, (2013): Principal of Public Finance Sahitya Bhavan Publication, Agra.
3. Pant, K.C., (2012): Public Finance
4. Sinha, V.C.,(2013): Public Finance and Economic, Sahitya Bhavan Publication.

Reference Books

1. Atkinson, A.B. and J.E. Siglitz (1980): Lectures on Public Economics, Tata McGraw Hill, New York.
2. Auerbach, A.J. and M. Feldstern (Eds.): Handbook of Public Economics, Vol. 1, North Holland, Amsterdam.
3. Government of India (1992): Reports of the Tax Reforms Committee – Interim and Final (Chairman : Raja J. Chelliah).
4. Chelliah, Raja J. et. Al (1981): Trends and issues in India's Federal Finance, NIPFP. New Delhi.
5. Peacock, A and G.K. Shaw (1976): The Economic Theory of Fiscal Policy, George Alen and Unwin, London.
6. Sahni, B.S. (Ed.) (1972): Public Expenditure Analysis: Selected Readings, Rotherdam University Press.
7. Musgrave, R.A. and P.B. Musgrave (1976): Public Finance in Theory and Practice, Mcgraw Hill, Kogakusha, Tokyo.
8. 14th Finance commission Report-2015
9. Central Govt. and Stat Govt. Budget- 2015

डॉ० शिखा अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहन प्रसाद

SEMESTER- III
ENVIRONMENTAL ECONOMICS
Paper – IV

Unit – I The Economics of Environment - Environmental Micro Economics and Macro Economics, The Circular Flow Model. Theory of Resources Environment and Economic Development - Economic Growth and The Environment, Future of Economic Growth and The Environment. Criterion of Social Welfare- Bentham Criteria, Pareto Optimality Criteria, Kaldor-Hicks Compensation Criterion.

Unit – II Economic Theory of Environmental Issues - The Theory of Environmental Externalities, Accounting for Environmental Cost, Internalizing Environmental Cost, Positive Externalities. Welfare Analysis of Externalities - Property Rights and The Environment. Common Property Resources and Public Goods - Common Property, Open Excess and Property Rights, Market Failure and Public Goods, Social choice of optimum pollution, Pigovian Taxes and subsidies, Maximization of Social Welfare Under Perfect Competition.

Unit – III Population, Agriculture and The Environment - Population and the Environment- Demographic Transition and Environment, Population Growth and Economic Growth, Population Policy for the 21st Century, Agriculture, Food and Environment, Sustainable Agriculture for the Future, Environment and Neo-Classical Modal of Natural Resources, Energy and Resources.

Unit – IV Ecological Economics, National Income and Environmental Accounting - Ecological Economics Basic Concept, Natural Capital and Accounting for Changes in Natural Capital, Macro Economic Scale, Model of Economic and Ecological System. National Income and Accounting - Natural Capital, System of Environment and Economic Accounts (SEEA).

Unit – V Environmental Value and Methods - Use Value, Option Value and Non Use Value, Cost Benefit Analysis, Methods of environmental valuation- Hedonic Pricing. Household Production Function, Travel Cost Method, Averting Behavior Approach, Contingent Valuation Method, International Carbon Tax. Environment and W.T.O.

Reference

1. Madhu Raj – Environmental Economics.
2. Steve Baker – Environmental Economics.
3. D.W. Pearce – Environmental Economics.
4. Baurnol, W.J. and W.E. Oates. (1988): The Theory of Environmental Policy, (2nd Edition), Cambridge University Press, Cambridge.
5. Thomas and Callan (2009): Environmental Economics.
6. Charles D. Kolasted (2005): Environmental Economics, Oxford University Press.
7. Brian Roach, Jonathan M. Harries and Anne Marie codur (2015): Microeconomics and the environment, Global Development and Environment Institute, Tufts University, Medford.
8. Jonathan M. Harries and Anne-Marie codur (2004): Macroeconomics and the environment, Global Development and Environment Institute, Tufts University, Medford.

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- III
DEMOGRAPHY
Paper – V

Unit – I Demography – Meaning and Importance, Theories of Population – Theory of Optimum Population and Theory of Demographic Transition. Measures of Population Change and Distribution – Rate of Population Change and Distribution, Measures of Degree of Concentration of Population – Lorenz Curve and Gini Concentration Ratio.

Unit – II Migration – Kinds and Factor Affecting of Migration, Hurdles of Migration, Measurement of Internal Migration, Migration Rates and Ratio. Urbanization- Factors Influencing Urbanization and Effects of Urbanization, Population and Economic Development. Human Resource Development in India.

Unit – III Mortality – Meaning and Sources of Mortality Data, Causes of High Death Rate in India, Trends in Death Rate in India, Measurement of Mortality Based on Death Statistics, Crude Death, Specific Death Rate, Infant Mortality Rate and Standardized Death Rate, Child Mortality Rate, Maternal Mortality Rate, Life Table – Functions and Construction of Life Table. Problems Related to Death Rates and Life Table.

Unit – IV Fertility– Meaning, Causes of High Birth Rate in India, Trends in Birth Rate in India, Measurement of Fertility and Reproduction – Crude Birth Rate, General Fertility Rate, Age- Specific Fertility Rate, Total Fertility Rate. Gross Reproduction Rate and Net Reproduction Rate. Problems Related to Fertility and Reproduction Rates.

Unit – V Women Empowerment- Economic Status, Women in Decision Making, Women and Labour Market; Women Work Participation: Concept and Analysis of Women's Work Participation, Structure of Wages across Regions and Economic Sectors, Determinants of wage Differentials, Gender and Education.

Text Books

1. Agrawal, S. N.: India's Population Problems, Tata Mc-Graw Hill co. Bombay.
2. Bogue, D. J.: Principles of Demography, Honwiley, New York.
3. Sinha, V. C. and Pushpa Sinha: Principles of Demography, Mayur Paper backs.
4. Mishra, Jai Prakash, Demography: Sahitya Bhawan Publications, Agra.
5. Pathak, K. B. and F. Ram,: Techniques of Demographic Analysis, Himalaya Publishing House.
6. Jhingan, M. L. and others: Demography, Vrinda Publications (P) Ltd.
7. Srinivasan, K.: Basic Demographic Techniques and Applications, Sage Publication.

Reference Books

1. Census India SRS Bulletins, Registrar General of India, Govt. of India, 2011
2. Rural-Urban distribution *Census of India: Census Data 2001: India at a glance >> Rural-Urban Distribution.* Office of the Registrar General and Census Commissioner, India. Retrieved on 2008-11-26.
3. Number of Villages *Census of India: Number of Villages* Office of the Registrar General and Census Commissioner, India. Retrieved on 2008-11-26.
4. Urban Agglomerations and Towns *Census of India: Urban Agglomerations and Towns.* Office of the Registrar General and Census Commissioner, India. Retrieved on 2008-11-26.
5. Preston, S.H.(1976):Family Sizes of Children and Family Sizes of Women. *Demography* 13(1): 105-114.
6. Pritchett, L.H. (1994). Desired Fertility and the Impact of Population Policies. *Population and Development Review* 20(1): 1-55.

डॉ० नीलम अग्रवाल डॉ० डी० पी० दुबे श्रीमती सुशीला शर्मा डॉ० सुधना बाखला डॉ० रोहण प्रसाद

SEMESTER - IV
ECONOMICS OF DEVELOPMENT AND PLANNING
Paper – I

Unit – I Economic Planning; Objectives, Achievements and Failures of Indian Plans, Resource Mobilization in Indian Plans, Strategy of Indian Plan. Saving, Capital Formation and Overall Growth Rate, Twelfth Five Year Plan (2012-17), Achievement of Eleventh Five Year Plan.

Unit – II Theories of Development:- The Marxian Model, The Schumpeterian Model, Keynesian Theory of Development, Rostow's Stages of Economic Growth.

Unit – III Approaches to Development:- Arther Lewis Model of Unlimited Supply of Labour,Ranis & Fie Model, Leibenstein's Critical Minimum Effort thesis, The Big push theory.

Unit – IV Development Models:- The doctrine of Balanced Growth, the concept of Unbalanced Growth, The Limits to Growth Model, Myrdal's theory of Circular Causation.

Unit - V Investment Criteria in Economic Development; The social Marginal Productivity Criteria, The capital Turnover Criteria, The Re-investment Criterion, Time Series Criterion, the Choice of Techniques.

Text books

1. Jhingan,M.L.(2003): The Economics of development & planning,Vrinda publication pvt. Ltd.
2. Shinghai ,G.C. & Mishra,J.P.(2013): Macro Economic Analysis, Sahitya bhawan publication Agra.
3. Mishra, J.P.(2012): Economics of Growth and Development, Sahitya bhawan publication Agra.

Reference Books

1. Todaro, M.P. (1996) (6th edition): Economic Development, Longman London.
2. Solow, R.M. (2000): Growth Theory An Exposition, Oxford University Press, Oxford.
3. United Nations, Human development Department report 2005.
4. Behrman, S. and T.N. Shrinivasan (1995): Hand book of Development Economics, Vol 1, 2 & 3, Elsevier; Amsterdam.
5. Ghatak,s (1986): An introduction to development Economics, Allen & elnein, London.
6. Sen, A.K. (Ed.) 1990 growth Economics, Penguin, Harmondsworth.
7. Dasgupta, P.A.K. Sen and S. Marglin (1972): Guidelines for project Evaluation, UNIDO, Vienna,
8. Mehrotra, S. and J. Richard (1998): Development with a Human Face, Oxford University Press New Delhi.

डॉ० शिखा अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधना बाखला डॉ० रोहण प्रसाद

SEMESTER- IV
INTERNATIONAL ECONOMICS
Paper – II

Unit – 1 Foreign Trade and Economic Development, The Theory of Regional Blocks- Customs Union, Static and Dynamic Effects of a Customs Union and Free Trade Area, Rational of Economic Progress of SAARC, ASEAN, IBSA and BRICS.

Unit – II Regionalism of European Union, The Euro-Dollar Market, NIEO,WTO- Functions of WTO, Multilateralism and WTO, TRIPS, TRIMS, Agriculture, Market- Access, Textile Clothing, Patent Rights, Ministerial Conferences of WTO, UNCTAD.

Unit – III Theory of Short Term & Long Term Capital Movement and International Trade– Port Folio Investment and International trade, FDI and International Trade, Merits & Demerits of Long Term Capital Movement in International Trade, Factors Affecting International Capital Movement, The Transfer Problem, Optimum Currency Area, Global Financial Crises.

Unit – IV International Monetary System, International Liquidity, IMF, World Bank, The World Bank Group, ADB, Foreign Capital in India.

Unit – V International Organisations- G-20, G-15, BIMSTEC, OPEC, NAFTA, OECD, Working and Regulations of MNCs in India.

Reference:-

1. Bhagwati, J. (Ed).(1981): International Trade, Selected Readings, Cambridge, University press, Massachusetts.
2. Carbough, R. J. (1999): International Economics, International Thompson Publishing, New York.
3. Chacholiades, M. (1990): International Trade: Theory and Policy, McGraw Hill, Kogakusha, Japan.
4. Dana, M.S. (2000): International Economics: Study Guide and Work Book, (5th Edition), Routledge Publishers, London.
5. Dunn, R. M. And J. H. Mutti (2000): International Economics, Routledge, London.
6. Kenen, P. B. (1994): The International Economy, Cambridge University Press, London.
7. Kindleberger, C. P. (1973): International Economics and International Economic Policy A Reader, McGraw Hill International, Singapore.
8. Krugman, P. R. and M. Obstfeld (1994): International Economics: Theory and Policy, Glenview, Foresman.

डॉ० शिखा अग्रवाल डॉ० डी. पी. कुर्रे श्रीमती सुशीला शर्मा डॉ० मुन्ना बाखला डॉ० रोहण प्रसाद

SEMESTER- IV
PUBLIC ECONOMICS
Paper – III

Unit – I Role of Public Finance in Economic Development, Major Fiscal Function, Concept of Social Goods. Fiscal Federalism in India, Principles of Fiscal Federalism, Vertical and Horizontal Imbalances.

Unit – II Federal Finance– Principle of Federal Finance in India, Centre–State Financial Relation, Resource Transfer From Centre to States, Gadgil's Formula. Fourteen Finance Commission.

Unit – III Indian Tax System:- Salient Features, Merits, Demerits, Measures for improvement of Indian Tax system Government measures for improvement:- Taxation enquiry Commission (1953-54), Wanchoo committee, Jha Committee, Kelkar Committee Report, Chelliah Committee Recommendations for reforming the taxation system.

Unit – IV Analysis of Centre & Chhattisgarh Govt, Budget. Taxable and Non Taxable Income of Chhattisgarh. Performance of the Chhattisgarh government budget.

Unit – V Financial Responsibilities and Budget Management Act. Structure and Growth of Public Expenditure in Chhattisgarh, Revenue Expenditure and Capital Expenditure. Plan & Non Plan Expenditure in Chhattisgarh.

Text Books

1. Lekhi, R.K.(2014): Public Finance, Kalyani Publication, Ludhiana New Delhi.
2. S.K.Singh,(2013): Principal of Public Finance Sahitya Bhavan Publication, Agra.
3. Pant, K.C. (2012): Public Finance
4. Sinha, V.C.(2013) : Public Finance and Economic, Sahitya Bhavan Publication.

Reference Books

1. Government of India (1992), reports of the Tax Reforms Committee – Interim and Final (Chairman : Raja J. Chelliah).
2. Chelliah, Raja J. et. Al (1981): Trends and issues in India's Federal Finance, NIPFP. New Delhi.
3. Peacock, A and G.K. Shaw (1976): The Economic Theory of Fiscal Policy, George Allen and Unwin, London.
4. Sahni, B.S. (Ed.) (1972): Public Expenditure Analysis: Selected Readings, Rotherdam University Press.
5. Jha, R. (1998): Modern Public Economics, Routledge, London.
6. Musgrave, R.A. and P.B. Musgrave (1976): Public Finance in Theory and Practice, McGraw Hill, Kogakusha, Tokyao.
7. Cornes, R. and T. Sandler (1986): The Theory of Externalities, Public Goods and Club Goods, Cambridge University Press. Cambridge.
8. Economic Servey Centre and State (2014-15)
9. 14th Finance commission Report- 2015
10. Central Govt. and State Govt. Budget- 2015

डॉ॰ निशा अग्रवाल डॉ॰ डी॰ पी॰ चौबे श्रीमती सुशीला शर्मा डॉ॰ सुधा बाखला डॉ॰ रोहण प्रसाद

SEMESTER- IV
ECONOMICS OF SOCIAL SECTOR
Paper – IV

Unit-1 Pollution- classification of pollution, Air, Water and Land Pollution, Cause & Effects of pollutant. Problem of solid waste management, Pollution control strategies, Equi-Marginal law of pollution, Global environmental issues- Climate change, Global warming, Green House Effect, Ozone depletion.

Unit-2 Development and Environment: Relation between development & environmental stress, The Environmental Kuznets Curve, The concept of Sustainable Development, Indicators of sustainability, Measuring sustainable development, Green Economy.

Unit-3 Economics of Resources- Classification of resources, Renewable & Non-renewable resources, Optimum use of resources. Land resources, Forest resources, Social forestry, Peoples participation in the management of Common & forest land. Energy- Sources of energy, energy efficiency & environment, Alternative sources of energy.

Unit-4 Economics of Education- Expenditure on education, Productive expenditure on education, Productivity of education, the return of education, Human capital, Human capital Vs Physical capital, Educational reforms and Right to Education Act.

Unit-5 Health Economics- Determinants of health care, Malnutrition. The concept of Human life, Inequalities in health- class & gender, Perspective HDI, GDI, GEM and HPI.

Reference

1. Baurnol, W.J. and W.E. Oates (1988): The Theory of Environmental Policy, (2nd Edition), Cambridge University Press, Cambridge.
2. Berman, P. (Ed.) (1995): Health Sector reform in Developing Countries: Making health development sustainable, Boston: Harvard Series on Population and International health.
3. Blaug, M. (1972) : Introduction to Economics of Education J Penguin, London.
4. Bromely, D.W. (Ed.) (1995): Handbook of Environmental Economics, Blackwell, London.
5. Cohn, E. and T. Gaske (1989): Economics of Education, Pergamon Press, London.
6. Fisher, A.C. (1981): resource and Environmental Economics, Cambridge University Press, Cambridge.
7. Hanley, N.J.F. Shogern and B. White (1997): Environmental Economics in Theory and Practice, Macmillan.
8. Hussen, A.M. (1999) : Principles of Environmental Economics, Routledge. London.
9. Jeroen, C.J.M. van den Bergh (1999): Handbook of Environmental and Resource Economics, Edward Elgar Publishing Ltd. U.K.
10. Thomas and Callan (2009): Environmental Economics.

डॉ० शिखा अग्रवाल डॉ० डी० पी० चौधरी श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहण प्रसाद

SEMESTER- IV

Paper – V

The MA students in the fourth semester would be required to appear for a Viva-Voce examination before the external examiner appointed by the University for marks of 100(Hundred). Viva-Voce will be conducted by the Department as per the rules and regulations of the University.

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डॉ० शिखा अग्रवाल डॉ० डी० पी० दुबे श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहण प्रसाद

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A./M.Sc.(Geography) Semester Exam

Session 2019-20

(Approved by Board of Studies)
Effective from July 2019

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

M.A./M. Sc. GEOGRAPHY

SEMESTER I (2019-20)

M. A. /M. Sc. Geography Semester I shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	I	Geomorphology	80	20	100
2.	II	Climatology	80	20	100
3.	III	Geographical Thought	80	20	100
4.	IV	Geography of India	80	20	100
5.	V	Practical-I : Advanced Cartography	---	---	100

1. The M. A. /M. Sc. Semester I examination in Geography shall consist of 500 marks.

There shall be four theory papers each of 100 marks and one practical of 100 marks as follows:

Paper I	Geomorphology
Paper II	Climatology
Paper III	Geographical Thought
Paper IV	Geography of India
Paper V	Practical-l: Advanced Cartography

2. The theory papers shall be of three hours duration.

3. Candidates will be required to pass separately in theory and practical examinations.

4. (a) In the practical examination the following shall be the allotment of time and marks.

(i)	Practical record	20%
(ii)	Lab work (up to three hours)	70%
(iii)	Viva on i. ii.	10%

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

(b) The external and internal examiners shall jointly submit marks.

(c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

27.5.19
(Dr. S. K. Das)

27.5.19

27/05/19

27.05.19
DR. R. Sharma

PAPER –I (2019-20)

GEOMORPHOLOGY

UNIT – I Nature and scope of Geomorphology; Fundamental concepts; Interior of the earth; Earth movement: epeirogenic and orogenic movements With reference to the evolution of the Himalaya: Forces of Crustal instability, Isostasy, Geosyncline, Plate tectonic, Mountain building, Earthquake and Vulcanicity.

UNIT – II Exogenic processes: concept of gradation; Agents and processes of gradation: weathering, wasting and erosion, aggradation; Climatic Geomorphology and morphogenetic regions; slope evolution, Arid Semi-Arid and Karst topography.

UNIT – III Concept of Geomorphic cycle and its controversy; Dynamic of glacial and pergiglacial processes and resulting landforms, Complications of fluvial geomorphic cycle and resulting landforms.

UNIT – IV Geological structure and landform: development of landscape and drainage on uniclinal, folded and domal structures and Erosion surfaces, Applied Geomorphology.

SUGGESTED READINGS:

1. Ahnned, E.: Coastal Geomorphology of India.
2. Chorley, R.. J.: Spatial Analysis in Geomorphology, Methuen, London, 1972.
3. Cooke R.IJ.and Doornkamp, J.C. : Geomorphology in Environmental Management. An Introduction, Clarendon press, Oxford, 1974.
4. Dury, G.H.: The Face of the Earth, Penguin Hormondsworth 1959.
5. Fairbridge, R.W. Encyclopedia of Geomorphology, Reinholdts, New York, 1968.
6. Goudie, A.: The Nature of the Environment Oxford & Blackwell, London, 1993.
7. Garner, H.F. : The Origin of landscape- A Synthesis of Geomorphology, Oxford University Press. London, 1974.
8. Holms, A.: Principles of Physical Geology, Thomas Nelson, London.
9. Mitchell, C.W.: '1'erra.ii'i Evaluation. Longman, London, 1973.
10. Oilier, C.D. : Weathering, Longman, London, 1979.
11. Pitty, A.F.: Introduction to Geomorphology, Methuen, London, 1971.
12. Stoddart, D.R. (ed.) : Process and Form in Geomorphology, Roullcdge, New York, 1996.
13. Skinner, B.J. & Porter, S.C.: The Dynamic Earth John Wilely. New York, 1995.
14. Sparks, B.W. Geomorphology, Longman, London, 1960.
15. Sharma, H.S. (cd.): Perspective in Geomorphology, Concept, New Delhi, 1980.
16. Singh, S : Geomorphology, Prayag Publication, Allahabad, 1998.
17. Steers, J.A. : The Unstable Earth Methuen, London.
18. Thornbury, W.I.). Principles of Geomorphology, John Wiloy, New York, 1960.
19. Strahler, A.N.: Physical Geography, Willey, New York.

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

20. कौशिक,एस.डी.: भू–आकृति विज्ञान
21. नेगी, बी,एस., भू–आकृति विज्ञान
22. दयाल परमेश्वर, भू–आकृति विज्ञान
23. यादव तथा रामसुरेश., भू–आकृति विज्ञान, ग्रनयि, कानपुर
24. सिंह,सविन्द्र के, भू–आकृति विज्ञान, शारदा पुस्तक भवन, इलाहाबाद

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PAPER - II (2019-20)

CLIMATOLOGY

UNIT – I Nature and scope of climatology and its relationship with meteorology; composition of atmosphere; Insolation, heat balance of the earth, stability and instability, greenhouse effect, vertical and horizontal distribution of temperature.

UNIT – II Jet stream; General circulation in the atmosphere; Acid rain; concept of air masses and Front. EL Nino and La Nino. Monsoon winds and cyclones.

UNIT – III The application of general principles of elementary physical and synoptic meteorology to the study and classification of climate. Climatic classification of Koeppen and Thornthwaite. Major climate of the world-tropical, temperate, desert and mountain climate.

UNIT – IV Climatic changes during geological and historical times, evidences, possible causes, global warming, Applied climatology.

SUGGESTED READINGS:

1. Barry, R.G. and Chorley P..1.; Atmosphere, Weather and Climate, Roulledge, London and New York, 1998.
2. Critchfiedid, J.H. : General Climatology, Prentico Hall, India, New Delhi, 1993.
3. Das, P.K. : Monsoons 'National Book Trust, New Delhi, 1987.
4. Fein, J.S. and Slephens, P.N. : Monsons. Wiley Interscience, 1987.
5. India Met. Deptt : Climatological Tables of Observatories in India, Govt. of India 1968.
6. Lal, D.S. : Climatology, Chaitanaya Publications, Allahabad, 1986.
7. Lydolph, P.H. : The Climate of the Earth, Rowiman, 1985.
8. Menon, P.A. : Our Weather, N.B.T.., New Delhi, 1989.
9. Pelerson, S. : Introduction to Meteorology, Me G-r-aw Hill Book, London, 1969.
10. Robinson, P.J. and Henderson S. : Contemporary Climatology, Henlow, 1999.
11. Thompson, R.D. and Perry, A (ed.) : Applied Climatology, Principles and Practice. Raoutledge, London. 1997.
12. तिवारी अनिल कुमार : जलवायु विज्ञान, राजस्थान हिन्दी ग्रंथ अकादमी
13. सिंह,सविन्द्र, प्रवालिका पब्लिकेशन्स, इलाहाबाद

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PAPER – III (2019-20)
GEOGRAPHICAL THOUGHT

UNIT – I The Field of geography, its place in the classification of science, geography as a social science, and natural science. Definition, scope and functions of geography; Geography as science of relationship, as science of areal differentiation, as spatial science, Spatial Organization, Geography and environmentalism: forms of man-nature relationship and current view; Dualism in geography; Regional Concept.

UNIT – II The growth of geographical knowledge from earliest times up to the 15th century. Contributions of Greek and Roman thinkers. Arab Geographers and their contributions. Geographical information in Ancient Indian literature. The dark age in Geography. The Great Age of Maritime Discovery and Exploration.

Contributions of various schools of thought in modern Geography:

(i) German School (ii) French School
(iii) British School (iv) American (v) Russian Schools.

UNIT – III Scientific explanations: routes to scientific explanation (inductive/deductive); Type of explanation: cognitive description, cause and effect, temporal, functional/ecological, systems; Laws, theories and models in geography; Quantitative revolution and philosophy of positivism.

UNIT – IV Responses to positivism, behaviourlism and humanistic, relevance movement and radical geography; Changing paradigms; Status of Indian Geography; Future of Geography.

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SUGGESTED READINGS:

1. Abler, Ronald; Adams, John S. Gold, Peler : Spatial Organization : The Geographer's view of the world. Prentice Hall, N.J. 1971.
2. Ali S.M. : The Geography of Puranas, Peoples Publishing House, Delhi, .1968.
3. Amedeo, Douglas : An Introduction to Scientific Reasonign in Geography, John Wiley, U.S.A. 1971.
4. Dikshit, R.D. (ed.): The Art & Science of Geography Rand Me Nally & Co., 1959.
5. Hartshorne, R.: Perspectives on Nature of Geography Rand Me Nally & Co., 1959.
6. Husain, M. : Evolution of Geographic Thought, Rawat Pub., Jaipur, 1984.
7. Johnston, R.J.: Philosophy and Human Geography, Edward Arnold, London, 1983.
8. Johnston, R.J.: The Future of Geography, Methuen, London, 1988.
9. Minshull, R.: The Changing Nature of Geography, Hutchinson University Library, London, 1970.
10. Ali, S. M.- Arab Geography.
11. Taylor, G.: Geography in the 20th Century.
12. Dikshit, R.D.: Geographical Thought : A Contexual History of Ideas, Prentice Hall of India, New Delhi.
13. Harvey D. : Explanation in Geography.
14. सिंह उजागर : भौगोलिक चिन्तन का विकास
15. त्रिपाठी एवं बिरलेः भौगोलिक चिन्तन का विकास एवं विधितंत्र
16. कौशिक, एस,डी.: : भौगोलिक विचारधाराओं का इतिहास एव विधितंत्र
17. सिंह, जगदीश : भौगोलिक चिंतन का मूलाधार.

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PAPER – IV (2019-20)

GEOGRAPHY OF INDIA

UNIT – I Physical and Biological elements in the Geography of India: Geological structure, relief, climate, Drainage, vegetation and soils.

UNIT – II Agriculture: Major characteristics and problems, Impact of infrastructural and institutional factors on agriculture. Important crops-wheat, rice, cotton, sugarcane, oil-seeds, tea and coffee, Agricultural regions. Green revolution, Agro-climatic regions.

UNIT – III Sources of power: Coal; Petroleum, Natural gas. Hydroelectricity and Atomic energy. Mineral resources with special reference to iron ore, manganese and bauxite. Industrial development with special reference to iron and steel, cement, cotton, jute, sugar and paper industries; Industrial regions.

UNIT – IV Regional division of India: Purpose and Methodology. Major schemes of regions of India: O.H.K. Spate and R.L. Singh. Physical and cultural geography of Chhattisgarh State.

SUGGESTED READINGS:

1. Centre for Science & Environment (1988) State of India's Environment, New Delhi.
2. Desphande C.D. India. : a Regional Interpretation ICSSR & Northern Book Centre 1992.
3. Dreza, Jean & AMartya. Sen (ed.) India Economic Development and Social opportunity Oxford University Person, New Delhi. 1996.
4. Kundu A. Raza Moonis : lndian Economy : the Regional Dimension Speclaum Publishers, New Delhi, 1992.
5. Robinson, Francs : The Cambridge Encyclopedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives Cambridge University Press, London, 1989.
6. Singh R.L. (ed.) : India - A Regional Geography National Geographical Society, India Varanasi, 1971.
7. Spale OHK & ATA Learnont-India & Pakistan Methuen, London. 1967.
8. Tirtha R. & Gopal Krishna, Emerging India Reprinted by Rawat Publications, Jaipur 1996.
9. Sharma T.C. and O. Coutinho : Economic and Commercial Geography of India.
10. अग्रवाल पी.सी. भारत का भौतिक का भूगोल, एशिया प्रकाशन कं.,रायपुर 2003
11. बंसल सुरेशचन्द : भारत का भौतिक का भूगोल, मिनाक्षी प्रकाशन , मेरठ.
12. वर्मा रामविलास, भारत : एक भौगोलिक विवेचन , भवदीय प्रकाशन श्रृंगारघाट – अयोध्या, फैजाबाद, पिन –224123,2007

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PAPER – V (2019-20)

PRACTICAL I - ADVANCED CARTOGRAPHY

Graphs and Diagrams: Triangular graph. Logarithmic and semi logarithmic graphs, scatter graphs; climatograph. Proportional circles, spheres and cubes.

Thematic Maps: Choropleth maps, isolines, Flow maps, isochrones and class intervals. Morphometric Analysis: Profiles, Slope Analysis; Altimetric, and Clinographic curves; Block Diagrams.

SUGGESTED READING:

1. Monk house F.J. & H.R. Wilkinson: Maps and Diagrams, Methuen, London.
2. मॉक हाउस तथा विल्किन्सन (अनु.प्रो.प्रेमचन्द अग्रवाल) : मानचित्र तथा आरेख म.प्र. हिंदी ग्रंथ अकादमी
3. हीरालालः प्रायोगिक भूगोल.
4. शर्मा, जे. पी. प्रायोगिक भूगोल,

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Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

M.A./M. Sc. GEOGRAPHY (2019-20)

SEMESTER – II

M. A. /M. Sc. Geography Semester II shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	VI	Economic and Natural Resource Management	80	20	100
2.	VII	Oceanography	80	20	100
3.	VIII	Regional Development and Planning	80	20	100
4.	IX	Social Geography	80	20	100
5.	X	Practical-II : Map Projections, Map Interpretation and Surveying	---	---	100

1. The M. A./M. Sc. Semester II examination in Geography shall consist of 500 marks.

There shall be four theory papers each of 100 marks and one practical of 100 marks as follows:

Paper VI	Economic and Natural Resource Management.
Paper VII	Oceanography
Paper VIII	Regional Development and Planning
Paper IX	Social Geography
Paper X	Practical-II : Map Projections, Interpretation and Surveying.

2. The theory papers shall be of three hours duration.

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3. Candidates will be required to pass separately in theory and practical examinations.

4. (a) In the practical examination the following shall be the allotment of time and marks.

(i) Practical record	20%
(ii) Lab work (up to three hours)	40%
(iii) Field work (up to three hours)	30%
(iv) Viva on i, ii & iii above	10%

(b) The external and internal examiners shall jointly submit marks.

(c) Candidates shall be examined in survey individually. They will however be allowed to take the help of a labourer each at their own expense.

(d) All the candidates shall present at the time of the practical examination their Practical record regularly signed by the teachers concerned.

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PAPER- VI (2019-20)

ECONOMIC AND NATURAL RESOURCE MANAGEMENT

UNIT – I Nature and scope of economic Geography; fundamental concepts in economic geography; classification of economies, sectors of economy (primary, secondary, tertiary). Meaning, nature and classification of resources, Resource appraisal: human wants and social objective, technological status and resources. Appraisal of quality and quantity of human resources, relation between population and resource, natural resources and economic development, resource adequacy and scarcity, limits to growth. Resource use, concept of absolute and relative abundance of resources, optimum, under use, misuse and over use of resources.

UNIT – II World pattern of major natural resources: land and soils, biotic resources, water resources mineral and energy resources, oceanic resources.

UNIT – III Classification of Industries, Theories of industrial location; case studies of selected industries; Iron and Steel; Aluminium, Chemical, Textile. Means of transport, International trade, trade blocks, globalization and Indian economy.

UNIT– IV Conservation and management of resources; evolution of the concept, principles, philosophy and approaches to conservation, resource conservation and management methods. Policy making and resource management; sustainable development of resources.

SUGGESTED READING:

Ahemd, Jaleel - Natural Resources in Low Income Contries.

Bennet, II.II. - Elements of Soil Conservation.

Ciriacy, Wantrup,S.V.& Persons (eds.) - Natural resources: Quality & Quantity

Betall,R.C. & R.O.Buehanan - Industrial Activity and Economic Geography.

Edvard and Rosers - Agricultural Resources.

Freeman, T.W. - Geography and Planning.

Fryer, D.M. - World Economic Development.

Isard, Walter - Method of Regional Analysis.

Mehta, M.M. - Human Resource Development Planning.

Owen, O.S. - Natural Resource Conservation.

Peach, W.N.& James, A. - Zimmerman's World Resources Contenting and Conservation.

Parkin's,E.A. & J.R. Whitakr - Our Natural Resource and their conservation.

Renner, G.T. - Conservation of National Recourses.

Stamp, L.D. - Land of Britain Its use and Misue.

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Smith, G.H.(ed.)	-	Conservation. of Natural Recourses.
Symoos, L.	-	Agriculture Geography.
Thomas W.L.(et.al.reds.)	-	Man's Role in Changing the face of the Earth.
Wales, H.& H.O. Lathrop	-	The Conservation of Natural Recourses.
Wheeler, T.O. et al	-	Economic Geography, John Wiler New York 1995.

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PAPER – VII (2019-20)

OCEANOGRAPHY

UNIT – I Nature and scope of Oceanography; Distribution of land and water; Major features of ocean basins; Marine sediments. Physical and chemical properties of sea water.

UNIT – II Interlink between atmospheric circulation and circulation pattern in the oceans, surface currents, Thermohaline, waves and tides.

UNIT– III Marine-biological environment : Bio-geochemical cycle in the ocean. biozones, types of organisms; plankton, nekton and benthos, food and mineral resources of the sea. Major marine environments; coastal : esturary, deltas, barrier island, rocky coasts : Open : reefs, continental shelf, continental slope and deep : Pelagic environment and floor of the ocean basins.

UNIT – IV Impact of Humans on the marine environment. Law of the sea; exclusive economic zone; marine deposits and formation of coral-reefs.

SUGGESTED READINGS:

1. Davis Rechard J.A. : "Oceanography-An Introduction to the Marine Environment". Wm. C. Brown Iowa, 1986.
2. Duxbury, C.A. and Duxbury B. : An Introduction to the world's Oceans-C. Brown. Iowa 2nd ed., 1986.
3. Garrison, T. : "Oceanography - An Introduction to Marine Science" Books/Cole, Pacific Grove, USA, 2001.
4. Gross, M. Grant : Oceanography, a View of the earth, prantice-Hall inc, New Delhi, 1987.
5. King C.A.M. Oceanography for Geographers 1962.
6. Sharma, R. C. "The Oceans" Rajesh N. Delhi, 1985.
7. Urnmerkutty, A.N.P. Science of the Eceans and Human life, NBT, New Delhi, 1985.
8. Ornmany, F.D. : The Ocean.
9. Sharma, R. C. & M. Vital : Oceanography : A Brief Introduction kislaya Pub. New Delhi.
10. Siddartha, K.. : Oceanography : A Brief Introduction, Kislya Pub. New Delhi.
11. नेगी ,बी.एस.: जलवायु तथा समुद्र विज्ञान.
12. सिंह, सविन्द्र सिंह – समुद्र विज्ञान, प्रयाग पुस्तक भवन, इलाहाबाद (उ.प्र.) 2011
13. लाल, डी. एस – समुद्र विज्ञान,

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PAPER – VIII (2019-20)

REGIONAL DEVELOPMENT AND PLANNING

UNIT – I Regional Planning: Definition, Scope, evolution and Objectives. Region and Regionalism, Planning Regions: Concept and Delineation. Type of Regions. Central Place Theory, Concept of core and periphery Friedmann's Model of Spatial Organisation and Economic Growth.

UNIT – II Regional Development Theories: Development Theories of Myrdal and Hirschman, Economic and Export Base model, Frank's Theory of Under development.

UNIT – III Approaches and Strategies of Regional Development: Growth Pole Theory Agropolitan Development, Community Development, River Basin Planning, Metropolitan Planning (with reference to India).

UNIT– IV Regional Planning in India. Regional Imbalances and Inequalities, Indicators of Regional Development; Regional Policies in Five Year Plans, Centre State Relations and Multilevel Planning, Planning for special problem Regions: Hill areas, Tribal areas, Drought prone areas, Command areas and River basins. Regional development and planning in India.

SUGGESTED READING:

1. Daysch, C.H.J. & others: Studies in Regional Planning.
2. Deckinsonm R.E. : City Region and Regionalism.
3. Freeman, E.W. : Geography arid Planning.
4. Golksin A. : Regional Planning and Development.
5. Keeble, L. : Principle and Practice of Town and Country Planning.
6. Stamp L.D. : The Land of Britain : Its use and Misure.
7. Sdasyuk. Gatina and Dengupta, P. : Economic Regionalization of India problems and Approaches.
8. Desai, P.B. & others : Regional Perspective of Industrial and Urban Growth the case of Kanpur, Bombay, 1969.
9. Prakash, Rao V.L. & S.P. : Regional Planning.
10. Censuts of India : Economic and Socio Cultural Dimensions of regionalization (An Indo-USSR Collaborative Study)

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11. Friedmann J. & Alonsow : Regional Development and Planning, M.I.T. Press.
12. Misra R.P. (ed.) : Regional Planning : Concept; Techniques, Policies and cade studies Mysore 1969.
13. Misra, R.P. & others : Regional Development and Planning in India.
14. Timbergen : Essays on World Regional Planning.
15. Lord, W. : Methods of Regional Analysis, M.I.T., I960.
16. Zimmerinan, E.W. : World Resources and Industries.
17. Burton & Kates : Reading in Resource Management Conservation.
18. Burton & Kates : Regional Planning in India.
19. Ahamed, Enayet : Regional Planning with particular Reference to India. Vol. I and li New Delhi.
20. Bhatt L.S. and others: Micro level planning - A Case Study of Karnal Area, Hyryana (K.B. Publishing, New Delhi)
21. Bhatt LS : Regional Planning in India, Statistical Publishing Society, Calcutta, 1973.
22. Gosal GS, and G. Krishanan : Regional Disparities in levels of Socio-economic Development in Punjab, Vishal Publications Kurukshetra, 1984.
23. Chandna, R.C. : Regional Planning : A comprehensive 'Text-Kajyani Publishers.
24. Ray Choudhari, Jayasri : An Introduction to Development and Regional Planning Orient Longman.
25. Sundaram, KV (ed) Geography and Plann8ing, Essaya in houour of VLS Prakasa Rao, Concept Publishing Co., New Delhi, 1985.
26. Raza, Meomis (ed) Regional Development, Hefitage Publishiers, Delhi, 1988.
27. Mishra R.P. et al : Multilevel Planning, Heritage Phulishers Delhi,1980.
28. श्रीवास्तव व्ही .के. एवं अन्य : प्रादेशिक नियोजन एवं संतुलित विकास.
29. ओझा, रघुनाथः प्रादेशिक नियोजन का भूगोल,.
30. शर्मा, राजीवलोचन : प्रादेशिक एवं नगरीय नियोजन.
31. चन्द्राकर, इन्द्रमन : व्यावहारिक भूगोल, वसुन्धरा प्रकाशन, गोरखपुर, 1998.

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PAPER – IX (2019-20)
SOCIAL GEOGRAPHY

UNIT– I Definition, meaning and scope of Social geography and its Nature and relationship with other Social sciences. Development of Social Geography, Approaches to the study of Social Geography.

UNIT– II Concept of Society – Social Environment, Geographic bases of Social Formation. Social Geography of India - Social Stratification, Caste and Class. Social organization and groups, Social transformation and change in India, Religion and linguistic group of India. Evolution of Socio-Cultural Regions of India.

UNIT – III Social well- being– meaning and indicators of Social well- being. Quality of life, Pattern and bases of rural and urban society. Deprivation and discrimination issues relating to women and under privileged groups. Cultural Realms and Cultural Region of the World.

UNIT – IV Social development planning – meaning and importance. Public policy and social planning in India: Review of Five year Plans strategies to improve social well-being in tribal, hill, drought and flood prone Areas.

SUGGESTED READINGS:

1 Ahmad Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999.
2 De Blij. H.D. Human Geography. John Wiley and son, New York.
3 Dreze Jean, Amariya Sen,Economic Development and Social opportunity. Oxford University Press. New Delhi. 1996
4 Dubey. S.C : lndian Society. National Book Trust, New Delhi, 1991.
5. Gregory. D . and J. Larry (Eds.) Social. relations and spatial structures. MC Millan. 1985.
6. Haq. Mahbubul : Reflections on Human Development. Oxford University Press, New Delh6.
7. Jones, Emrys, Reading in Social Geography, Oxford University Press, Ely House, London, 1977.
8. Jones, Emrys and John Eyles, An Introduction to Social Geography, Oxford University Press, London,1977.
9. Maioney. Clarence: People of South Asia, Winston, New York, 1974.
10. Planning Commission, Government of India: Report on Development of Tribal areas, 1981.
11. Rao, M.S.A.. Urban Sociology in India, Orient Iongman, 1970.
12. Schwartzberg Joseph : An Historical Atlas of South Asia, University of Chicago Press, (Chicago, 1978.
13. Sen, Amartya & Dreze Jean. Indian Development : Selected Regional Perspectives. Oxford University Pres-s, 1996

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14. Smith, David: Geography : A welfare Approach, Edward Arnold, London, 1977.
15. Sopher, David. An Expoloration of Inda, Cornell University Press, 1980.
16. Subba. Rao. Personality of India : Pre and Proto Historic foundation of India and Pakistan, M.S. University Baroda. Vadodai'a, 1958
17. मौर्य, एस.डी., सामाजिक भूगोल शारदा पुस्तक भवन,11 युनिवर्सिटी रोड इलाहाबाद–2,2004.

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PAPER – X (2019-20)

PRACTICAL II- MAP PROJECTIONS, INTERPRETATION AND SURVEYING

Map Projections: Mathematical/Graphical construction of world

projections. Interpretation of Maps: Geological Maps.

Principles and methods of topographical surveying involving the use of Theodolite and Dumpy level. Solution of problems in Surveying.

Topographical Information – International series, South east Asia Series, Indexing, Classification & Interpretation of topographical sheets.

SUGGESTED READINGS:

1. Davis, R. C. & E. S. Forte : Surveying : Theory and Practical.
2. Kanetkar, T.R. & S.V. Kulkarni: Surveying and leveling part I & IJ A.V.G. Prakashan, Poona.
3. Monkhouse F.J. & H.R. Wilkinson: Maps and Diagrams, Methuen, London.
4. मॉक हाउस तथा विल्किन्सन (अनु.प्रो.प्रेमचन्द अग्रवाल) : मानचित्र तथा आरेख म.प्र. हिंदी ग्रंथ अकादमी .
5. हीरालालः प्रायोगिक भूगोल.

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Hemchand YadavVishwavidyalaya, Durg (C.G.)

M.A./M. Sc. GEOGRAPHY
SEMESTER III (2019-20)

M.A. /M. Sc. Geography Semester III shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	XI	Population Geography	80	20	100
2.	X II	Settlement Geography	80	20	100
3.	XIII (A)	Remote Sensing Techniques	80	20	100
	OR	**OR**			
4.	XIII (B)	Biogeography and Ecosystem	80	20	100
5.	XIV	Research Methodology	80	20	100
	XV	Practical-III : Remote Sensing and Quantitative Techniques	---	---	100

1. The M.A. /M. Sc. Semester III examination in Geography shall consist of 500 marks.

   There shall be four theory papers each of 100 marks and one practical of 100 marks as' follows:

   Paper XI : Population Geography

   Paper XII : Settlement Geography

   Paper XIII (A) : Remote Sensing Techniques

   OR

   Paper XIII (B) : Biogeography and Ecosystem

   Paper XIV : Research Methodology

   Paper XV : Practical – III: Remote Sensing and Quantitative Techniques

2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examinations.
4. (a) In the practical examination the following shall be the allotment of time and marks.

   (i) Practical record : 20%

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(ii) Lab work (up to Four hours) : 70%

(iii) Viva on i.& ii. Above : 10%

(b) The external and internal examiners shall jointly submit marks.

(c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

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SEMESTER – III (2019-20)

PAPER - XI

POPULATION GEOGRAPHY

UNIT – I Definition and scope of Population Geography. Relation of Population Geography with other subjects of social sciences. Historical development of Population Geography in western countries and in India. Sources of population data, Census and its history.

UNIT – II Distribution of Population: The concept of population density and its types. Factors affecting population distribution. Distribution & Density of population in the world with special reference to Europe, Asia and India. Growth of population: Measure of decennial and annual rates of population growth, prehistoric and modern trends of population growth in the world. Regional aspect of population growth in India. Population theories. Demographic transition.

UNIT– III Population composition in terms of age and sex, rural, urban residence, educational status and occupational structure. Significance of these elements in population analysis, factors affecting their composition in population, broad world patterns and detailed spatial patterns in India. Fertility and Mortality of population: Significance and factor. Indices and rates. World pattern and pattern in India. Human Development Index and its Components.

UNIT– IV Migration of population: Causes, characteristics and types. Methods of estimating value of internal migration. Important international migrations of the world, internal migration in India: Population and Resources: Population-Resource regions. Population Regions: Concept and methods, population regions of India, population policies of India.

SUGGESTED READINGS:

1. Bilasborruw, Richard Ii and Daniel Hogan, Population and Deforestation in the Humid Eropics, International Union for the Scientific Study of Population, Belgium 1999.
2. Boglia, D.J. Principles in Demography, John Wiley, New York 1969.
3. Bose, Ashish el at. : Population in India's Development (1947-2000); Vikas Publishing House, New Delhi, 1974.
4. Census of India, India : A State Profile, 1991.
5. Chandna, R. C. Geography of Population, Concept, Determinants and Patterns. Kalyani

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6. Clarke, John 1. Population Geography, Pergamon Press, Oxford, 1973.
7. Crook, Nigel Principles of Population and Development Pergmaon Press. New York 1997.
8. Daugherty, Helen Gin, Kenneth C.W. Kammeyir, An Introduction to Population (Second Edition), The Guilford Press, New York, London, 1998.
9. Garnicr, B.J. Geography of population Longrrian, London. 1970.
10. oclihar, Ra)esh, The Veclic People : Their History and Geography Orient I ongman Ltd., New Delhi, 2000.'
11. Mamoria, C.B. India's Population Problem, Kitab Mahal New Delhi, 1981.
12. Mjtra, Ashok India's Population : Aspects of Quality and (control Vol I & 11. Abhiman Publications, New Delhi, 1978.
13. Premi, M.K. India's Population : Heading Towards a Billion, B.R.., Publishing Corporation 1991.
14. Srinivasan, K. and M. Vlassoff, Population Development Nexus in India :Challenges for the New Millennium Lata Me Graw-Hill, New Delhi, 2001.
15. Srinivasan K. Basic Demographic Techniques and Applications Sage, Publications, New Delhi, 1998.
16. Sunda.ra.m K. V. a.nd Sudesh Nangia., (ed.) Population Geography, Henlage Publications, Delhi, 1986.
17. UNDP : Human Development Report, Oxford University Press, Oxford, 2000.
18. United Nations, Methods for Projections of urban and Rural Population No. VIII, New York, 1974.
19. Woods R.. Population Amalysis' in Geography Longman, London, 1979.
20. Zeiinsky Wilbur, A Prologue to Population Geography, Prentic Hall, 1966.
21. बघेल, अनुसुइया : अनुसूचित जातियों एवं अनुसूचित जनजातियों में प्रजननता प्रतिरूप : छत्तीसगढ़ राज्य के रायपुर संभाग के विशेष संदर्भ में', पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर, 2002.
22. बघेल, अनुसुइया : शिशु मर्त्यता : सिंघई पब्लिशर्स एण्ड डिस्ट्रीब्यूटर, रायपुर, 2004.
23. शर्मा, सरला : औद्योगिक नगरों में जनसंख्या आप्रवास (भिलाई एवं कोरबा नगर के विशेष संदर्भ में), प.ंरविशंकर शुक्ल विश्वविद्यालय, रायपुर, 2002.
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25. ओझा, रघुनाथ : जनसंख्या भूगोल. हीरालाल : जनसंख्या भूगोल.
26. चन्दना, आर.सी. : जनसंख्या भूगोल. त्रिपाठी,
27. रामदेव : जनसंख्या भूगोल.

SEMESTER – III (2019-20)

PAPER - XII
SETTLEMENT GEOGRAPHY

UNIT – I Meaning, Objectives and Scope of Settlement Geography; Evolution, Distribution, Types and Patterns of Rural Settlements; Rural House Types; Rural Service Centers.

UNIT – II Evolution and growth of urban settlements; The Geographical setting of Urban Centers: Site, Situation and Location.

UNIT – III Rank- size-relationship; Cities as Central Places, Central Place Theory, Growth Centre Theory.

UNIT – IV City- Country Relationship: Umland, Rural-Urban Fringe.

SUGGESTED READINGS:

1. Abercrombee, Sir P. : Town and Country planning 1961.
2. Alani, Shah Manzoor : Hyderabad Secuiidrabad (Twin Cities) A. study in urban geography)
3. Alam, S.M. & V.V. Tokshishevesky : Urbanization in developing countries.
4. Berry Brain .1. L. : Geographic Prospective on Urban .Systems.
5. Bresse, C. & D.F. Whiteman : An approach to Urban Planning
6. Dickinson, R.E, : City, Religion and Regionalism.
7. Gallion and Fisher : The Urban Pattern.
8. Grifitth, , J.P : A study of Urban constructions in India.
9. Gibbs : Urban Research Methods.
10. Mayor, H.M. & (.,'.1". Kohn : Readings in Urban Geography.
11. Morgan, F.W. : Ports and Harbours.
12 Mumford L. : Culture of cities.
13. Robson, W.A. : Great cities of world.
14. Robson, B.T. : Urban Growth : An approach, Methuen, London.
15. Carter, Harold : Study of Urban Geography, London, Edward Arnold, 1979.
16. Singh R.I.,. & K.N. Singh : Readings in Rural Settlement Geography, NGSI Varanasi, 1975.
17. सिंह, उजागिर : नगरीय भूगोल
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PAPER – XIII (A)
REMOTE SENSING TECHNIQUES

UNIT– I Historical development of remote sensing as a technology - Relevance of remote sensing in Geography - Concepts and basics: Energy source, energy and radiation principles, energy interactions in the atmosphere and earth surface features, remote sensing systems: platform sensors and radiation records. Microwave sensing interpretation of SLAR imageries, thermal imageries.

UNIT– II Remote Sensing Satellite: platforms LANDSAT, SPOT, NOAA, RADARSAT, IRS, INSAT: principles and geometry of scanners and CCD arrays, orbital characteristics and data products - MSS, TM, LISS I & II, SPOTPLA & MLA, SLAR.

UNIT– III Image Processing: Types of imagery, techniques of visual interpretation, ground verification transfer of interpreted thematic information to base maps-digital processing: rectification and restoration, image enhancement - contrast manipulation, Classification: Supervised and Unsupervised, post-classification analysis and accuracy assessment.

UNIT– IV Applications: Air photo and image interpretations, arid mapping land use and land cover, land evaluation, urban land use, landform and its processes, weather studies and studies of water resources: integration of Remote Sensing and GIS. Remote sensing and hazard management, remote sensing and environmental management.

SUGGESTED READINGS:

1. American Society of Photogrammetry: Manual of Remote Sensing. ASP, Falls Church V.A., 1983.
2. Barrett E.C. and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation on, Memillan, New York, 1992.
3. Compbell J.: Introduction to Remote Sension, Guilford, New York, 1989.
4. Curran, Paul J.: Principles of Remote Sensing. Longman, London, 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Date, Academic, New York, 1983.
6. Luder D,, Aerial Photography Interpretation: Principles and Application, CcGraw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
8. Rao D. P. (eds.): Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hederabad, 1998.
9. Thomas M. Lollesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, Wiley & sons, New York, 1994.
10. Aronoff S. Geographic Information Systems : A. Management Perspective, Publication Offiawa, 1989.
11. Burrough P.A. Principles of Geographic Information Systems for Land Reson Assessment Oxford University Press, New York, 1986.
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13. Maquire D.J.M.F. Goodchild and D.W. Rhind (eds.). Geographic information System 'Principles arid Application. Taylor & Francis, Washingron, 1991.
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15. Peuquet D. .1. and D.F.- Marble, Introductory Reading in Geographic. Information System Taylor & Francis, Washington, 1990.
16. Star J. and J. Estes, Geographic Information Systems : An Introduction, Prentice Englewood Cliff, New Jersey, 1994.
17. चौनियाल, देवी दत्त : सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली.

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PAPER – XIII (B) (2019-20)

BIOGEOGRAPHY AND ECOSYSTEM

UNIT– I Definition and scope of Biogeography Environment, Habitat and Plant-animal association, Biome Types.

UNIT– II Elements of plant geography, distribution of forests and major communities. Plant successions in newly formed land forms. Zoogeography and its Environmental Relationship. Palaeo botanical and Palaeo climatological records of environmental change.

UNIT– III Ecosystems: concept and components, Ecosystem-form and function: tropic level, ecological pyramids, ecological niche, energy and nutrients in the ecosystem, hydrological cycle, food chains and food webs. Major terrestrial ecosystems of the world: agriculture, forests, grassland and desert. Population growth and environment.

UNIT– IV Biodiversity and its Conservation. Preservation and conservation of the ecosystem through resource management, Environment legislation. The Stockholm conference, the Earth summit, Environmental laws in India (the Wild Life Act, Water Act, Forest Act, Environment Protection Act and National Environment Tribunal Act).

SUGGESTED READINGS -

1. Agrawal D.P. : Man and Environment in India through Ages, Book & Books, 1992.
2. Bradshaw, M.J. : Earth and Living Planet, ELBS. London, 1979.
3. Cox, C.D. and Moore, P.D. : Biogeography : An Ecological and Evolutionary Approach 5th edn. Blackwell, 1993.

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SEMESTER – III (2019-20)

PAPER - XIV
RESEARCH METHODOLOGY

UNIT – I Research Methodology-An Overview; Procedure of scientific Research, Defining Research Problem; Formulating Hypothesis; Research Design.

UNIT – II Methods of Data Collection: Observation, Questionnaire, Schedule and Interview; Sampling: Sampling Methods, Size of Sample;

UNIT – III Processing and Analysis of Data: Processing- Editing, Coding, Classification and Tabulation, Analysis – Measurement of Central Tendency, Dispersion, Correlation.

UNIT – IV Preparation of Research Reports: Steps, Layout and Types of Reports

1. Gaur, R. : Environment and Ecology of Early Man in Northern India R. B. Publication Corporation 1987.
2. Hoyt, J.B. Man and the Earth, Prentice Hall, U.S.A. 1992.
3. Huggett. R.J. : Fundamentals of Biogeography, Routledge, U.S. A. 1998.
4. Illes, J. : Introduction to Zoogeography, Mcmillan, London, 1974.
5. Khoshoo, T. N. and Sharma. M. (eds) : Indian Geosphere-Biosphere Har-Anand Publiction, Delhi 1991
6. Lapedes, D.N.(ed) : Encyclopedia of Environmental Science, McGraw Hill, 1974.
7. Mathur H.S. : Essentials of Biogeography, Anuj Printers, Jaipur, 1998.
8. Pears, N. : Basic Biogeography, 2nd edn. Longman, London, 1985.
9. Simmons, I.G. Biogeography, Natural and Cultural, Longman, London, 1974.
10. Tivy J. : Biogeography: A Study of Plants in Ecosphere 3rd edn. Oliver and Boyd, U.S. A., 1992.
11. Ackerman, E.A. : Geography as a Fundamental Research Discipline, University of Chicago Research Papers, 1958
12. Agarwal, A. and Narain, S. : The Citizens Fith Report. Centre for Science and Environmental, New Delhi, 1999.
13. Bertalanffy, L. : General Systems Theory, George Bragiller, New York, 1958.
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15. Chandana, R.C. : Environmental Awareness, Kalyani Publishers, New Delhi, 1958.
16. Chorley, R.J. : Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.
17. Eyre, S.R. and Jones, G.R.J. (eds) Geography as Human Ecology, Edwares Arnold, London, 1966.
18. Kormondy, E.J. : Concepts of Ecology, Prentice Hall, 1989.
19. Manners, I.R. and Mikesell, M.W. (eds.) Prespectives on Environment, Commission on College Geography, Publ. No. 13 Washington, D.C., 1974.
20. Nobel and Wright : Environmental Science, Prentice Hall, New York, 1996.
21. Odum, E.P.: Fundamentals of Ecology, W.B. Saunders, Philadelphia, 1971.
22. Russwurm, L.H. and Sommerville, E. (eds.) : Man's Natural Environment-A Systems Approach, Duxbury, Massachuselts, 1985.
23. Sharma, H.S. : Ranthambhore Sanctuary – Dilemma of Eco-development, Concept, New Delhi, 2000.

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25. Singh S. : Environmental Geography, Prayag Publications, Allahabad, 1991.
26. Smith, R.L. : Man and his Environment : An Ecosystem Approach, Harper & Row, London, 1992.
27. U.N.E.P. : Global Environmental Outlook, U.N. Pub. , New ork, 1998.
28. World Resources Institute : World Resoources, (Latest Report) Washington.
29. कुलश्रेष्ठ, कामता प्रसादः जैव भूगोल.

SUGGESTED READING:

1. Selltiz, C.M. Jahoda, M. Deutsch and others.	Research Methods in Social Relations, Holt, . New York, 1961.
2. Goode, W and P.K, Hatt	Methods in Social Research, Mc Graw Hill, .Tokyo, 1962.
3. Harvey, David	. Explanation in Geography, Edward Arnold, London, 1971
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5. Minshull, R.	Introduction to Models in Geography. Longman London, 1975.
6. Sheskin, I.M.	Survey Research for Geographers Scientific Publisher, Jodhpur, 1987.
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8. Misra H.N. and V.P. Singh	Research Methodology in Geography: Social, Spatial and Policy Dimensions, Rawat Publications New Delhi, 1998.
9. Har Prasad	Research Methods and Techniques in Geography, Rawat Publications, New Delhi. 1992.

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SEMESTER – III (2019-20)
PAPER - XV
PRACTICAL -III

Remote Sensing, Interpretation of Topographical Sheets and Quantitative Techniques

1. **Principles of Photogrammetery: -** Air Photo- Stereo test, Orientation of stereo model under mirror stereoscope, Preparation of photo/line index and determination of photo scale, Use of parallax bar and determination of heights, Identification of features on aerial photo graph, Tracing of details from stereo pair, Interpretation of physical and cultural details, Preparation of Land use map pre field interpretation, Field visit for ground truthing.
2. **Remote Sensing:–** Study of satellite Image – Annotation Identification of features on FCC imageries, Tracing of details from satellite imageries, Basic Principles of Image interpretation, Interpretation of Physical and Cultural details and preparation of land use and land cover map using IRS Images. Pre field visit.

Statistical Techniques:

Product moment and Rank Correlation Coefficients, Linear Regression. Hypothesis Testing: Chi-Square test, t-test & F test, Sampling Techniques, Point, Line and Area Sampling.

SUGGESTED READINGS:

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church V.A. 1983.
2. Barren E.C. and I...F. Clirtis : Fundamentals of Remote Sensing and Air Photo Interpretation 'on, Memillan, New York, 1992.
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12. Fraser Taylor D.R. Geographic information Systems. Pergamor Press, Oxford 1990.
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Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

M.A./M. Sc. GEOGRAPHY
SEMESTER IV (2019-20)

M.A./M.Sc. Geography Semester IV shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Int. Ass.	Total
1.	XVI	Urban Geography	80	20	100
2.	X VII	Agricultural Geography	80	20	100
3.	XVIII (A)	Geographical Information System	80	20	100
	OR	**OR**			
4.	XVIII (B)	Environmental Geography	80	20	100
5.	XIX	Field Work (Physical and Socio- Economic)	---	---	100
6.	XX	Practical-IV :Geographical Information System and Quantitative Techniques	---	---	100

1. The M.A./M.Sc. Semester IV examination in Geography shall consist of 500 marks.

   There shall be three theory papers and one Field Work report each of 100 marks and one practical of 100 marks as follows.

S. No.	Paper		Title
1.	XVI	:	Urban Geography
2.	XVII	:	Agricultural Geography
3.	XVIII (A)	:	Geographical Information System
			OR
4.	XVIII (B)	:	Environmental Geography
5.	XIX	:	Field Work (Physical and Socio- Economic)
6.	XX	:	Practical-IV : Geographical Information System and Quantitative Techniques

2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examinations.
4. Candidates will be required to submit their Field Report in three copies in hard bound at least one hundred pages for Valuation.
5. (a) In the practical examination the following shall be the allotment of time and marks

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(i)	Practical record	20%
(ii)	Lab Work (up to Four Hours)	70%
(iii)	Viva on i & ii above	10%

(b) The external and internal examiners shall jointly submit marks.

(c) All the candidates shall present at the time of practical examination their practical record regularly signed by the teacher concerned.

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SEMESTER – IV (2019-20)
PAPER-XVI

URBAN GEOGRAPHY

UNIT – I Definition, Objective and Scope of urban geography, General Nature of City Structure.

UNIT – II Internal structure: Morphology and Land use. Theories of Urban Structure: The Concentric Zone Theory, the Sector Theory, the Multiple Nuclei Theory. Commercial Structure of Cities; The Central Business District (CBD),

UNIT – III Centrifugal and Centripetal forces in Geography, Economic Base of Towns: Basic, Non-basic concept. Urban Functions: Functional Classification of Towns: Webb, Harris, and Nelson.

UNIT – IV Contemporary Urban Issues: Urban renewal, Urban sprawl, Slums, Environmental Pollution, Urban Planning; Landuse Planning, Urban and Metropolitan Planning in India.

SUGGESTED READINGS:

1. Abercrombee, Sir P. : Town and Country planning 1961.
2. Alam, Shah Manzoor : Hyderabad Securdrabad (Twin Cities) A. study in urban geography)
3. Alam, S.M. & V.V.Tokshishevesky : Urbanization in developing countries.
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12. Mayor, H.M. & Kohn : Readings in Urban Geography.
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25. बंसल सुरेश चन्द : नगरीय भूगोल.
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27. तिवारी आर.सी.: आधिवास भूगोल प्रयाग पुस्तक भवन, इलाहाबाद 1997.
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DR. R. Sharma

SEMESTER – IV (2019-20)
PAPER – XVII
AGRICULTURAL GEOGRAPHY

UNIT – I Nature, scope, significance and development of agricultural geography. Approaches to the study of agricultural geography: Commodity, systematic and regional systems. Origin and dispersal of agriculture. Sources of agricultural data.

UNIT – II Determinants of agricultural land use - Physical, economic, social, and technological Land holding and land tenure systems, Land reforms, land use Agriculture policy and planning. Selected agricultural concepts and their measurements; cropping pattern, crop concentration, intensity of cropping, degree of commercialization, diversification and specialization, efficiency and productivity, crop combination regions and agricultural development.

UNIT – III Theories of agricultural location based on several multi-dimensioned factors:-Von Thunen's theory of agricultural location and its recent modifications; Whittlesey's classification of agricultural regions; land use and land capability.

UNIT – IV Contemporary Issues: Food, nutrition and hunger, food security, drought and food-security, .food aid Programmes; role of irrigation, fertilizers, insecticides and pesticides, technological know-how. Employment in the agricultural sector: landless labourers, woman, children: occupational and agricultural activities.

SUGGESTED READINGS:

1. Bayliss Smith, IP.: The Ecology of Agricultural Systems. Cambridge University London, 1987.
2. Berry, BJ.L et. al. : The Geography of economic Systems. Prentice Hall, New York, 1976.
3. Brown, L.R. : The Changing World Food Prospects - The Nineties and Beyond, World Watch Institute, Washington D.C., 1990.
4. Dyson, T. : Population and Food - Global Trends and Furure Prospects. Routledgle. London, 1996.
5 Gregor, H.P. : Geography of Agriculture. Prentice Hall, New York, 1970.
6. Grigg, D.B. : The Agricultural Systems of the World. Cambridge University Press, New York 1974.
7. Hartshorn, T.N. and Alexander, J.W. : Economic Geography. Prentice Hall, New Delhi, 1988
8. Mannion, A.M. : Agriculture and Environment Change, John Wiley, London, 1995.
9. Morgan W.B. and Norton , R.J.C. : Agricultural Geography. Mathuen, London, 1971.
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27.5.19
(Dr. S. K. Das)

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SEMESTER – IV (2019-20)

PAPER – XVIII (A)

GEOGRAPHICAL INFORMATION SYSTEM

UNIT – I Spatial Science : Geography as a spatial science, maps and spatial information dynamics of spatial information, elements of information technology, Geographic objects and their relations definition and development of GIS, computer environment for GIS.

UNIT – II Spatial Data: Elements of spatial data: data sources: Primary and secondary census and sample data, quality and error variations Raster and vector data structures, data conversion comparison of raster and vector data bases, methods of spatial interpolation – GIS data formats for the computer environment.

UNIT – III GIS Technology: Coordinate system-basic principles of cartography and computer assisted cartography for GIS – remote sensing data as a data source for GIS integration of GIS and remote Sensing-GPS and GIS: technology, data generation and limitations – visualization in GIS-Digital Elevation Models (DEM and TINS).

UNIT – IV GIS Application: GIS as a Decision Support System –expert system for GIS-basic flow chart for GIS application – GIS standard legal system and national GIS policy application of GIS in Land Information System, Urban Management, Environmental Management and Emergency Response System.

SUGGESTED READINGS:

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church V.A., 1983.
2. Barrett E.C. and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation on, Memillan, New York, 1992.
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27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Sharma

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27.5.19
(Dr. S. K. Das)

27.5.19

27.05.19
DR. R. Chauhan

27/05/19

SEMESTER – IV (2019-20)
PAPER – XVIII (B)
ENVIRONMENTAL GEOGRAPHY

UNIT – I Environment: Meaning, definition, concepts and theories related to environment. Environment and its components: Classification, Characteristics and their interdependent relationship, Development of the environmental studies and their approaches: Development of environmentalism in Geography.

UNIT – II Environment and development. Ecological concepts; Geography as human ecology; Ecosystem: meaning definition, Concept and components. Main terrestrial ecosystems of the world-forests and agriculture.

UNIT – III Environmental hazards- natural and human made, environmental pollution : meaning definition, nature and types-air, water, noise and others. Ecological impacts of pollution. Resource use and ecological imbalance with special reference to soil, forests and water resources.

UNIT – IV Environmental Management: meeting, importance and approaches, need for environmental policy and laws. Preservation and conservation of environment through resource management (Green revolution, Chipko movement, National Parks). Environmental Actions: concept, need and importance Stockholm Conference, Earth Summit, E.I.A. definition and methods and need for EM Environmental education and People's participation.

Suggested Readings :

1. Agrawal, Anil and Sunita Narain. Dying Wisdom : The Fourth citizen Report. Centre for Science and Environment, New Delhi, 1998.
2. Burton I.; R.W. Kates & G.F. Whiley. The Environment as Hazards. O. U.P. New York, 1978, Carledge, Bryen. Population and the Environment, O.U.P., New York, 1995.
3. Chandna, R.C. Environmental Awareness Kalyani Punlishers, New Delhi, 1998.
4. Dawson, J. and J.C. Doornkamp, eds.: Evaluating the Human Environment. Edward Amold, London, 1975
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7. Goudie, Andrew. The Human Impact on the Natural Environment, Blackwell Oxford, U.K. 1994
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27.5.19

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27.05.19 DR. R. Sharma

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12. नेगी, पी. एस. : परिस्थितिकीय विकास एवं पर्यावरण भूगोल, रस्तोगी एन्ड कम्पनी, मेरठ, 1995।
13. रघुवंशी अरूण और चन्द्रलेखा रघुबंशी : पर्यावरण तथा प्रदूषण, मध्यप्रदेश हिन्दी ग्रथ अकादमी, भोपाल, 1989
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27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

SEMESTER – IV, (2019-20)

PAPER - XIX

FIELD WORK (PHYSICAL AND SOCIO- ECONOMIC)

UNIT – I Trace the prominent features of area to be surveyed. Identify salient landform features of selected area on a topographical sheet. Identify the landforms on the surface, while in the field. Also note the agents of erosion, transportation and deposition associated with the landforms.

UNIT – II Identity and classify the Bio-diversity in the area (Flora & fauna). Observe the relationship of various landforms, flora and fauna with land-use, settlement structure and life style of people.

Socio – Economic

UNIT – III Procure a cadastral map of the village/town for field mapping of the features of land-use and land quality. Procure/prepare the settlement –site map through rapid survey to map the residential, commercial, recreational (parks, playground), educational, religious and other prominent features. Conduct a socio-economic survey of the households with a structured questionnaire. Supplement the information by personal observations and perceptions.

UNIT – IV Based on observations of the land-use and results of the socio-economic enquiry of the households, prepare a critical field-survey report. Photographs and sketches, in addition to maps and diagrams, may supplement the report.

27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Chandra

SEMESTER – IV, (2019-20)

PAPER - XX PRACTICAL-IV

GEOGRAPHICAL INFORMATION SYSTEM AND QUANTITATIVE TECHNIQUES

Geographical Information System

An overview of GIS software, Elements of GIS: Data capture-verification and preprocessing-data storage and maintenance of databases-Database Management Systems: Spatial data creation, Editing the layers and table creation, Creation of non Spatial data, data manipulation, analysis (integrated analysis of spatial and attribute data, overlay analysis, neighborhood operations and connectivity functions) and spatial modeling-output format and generation. Buffer analysis, Network Analysis, Creation of DEM & TIN Generation of thematic map.

GPS – Demonstration and handling of Hand held GPS receivers, Checking and updating of existing map, Use of GPS to Check/update the existing topographical map, Ground truthing by GPS.

Quantitative Techniques:

Running mean, Mean centre, Nearest Neighbor Analysis; Lorenz Curve, Normal distribution curve, Probability.

SUGESSTED READINGS:

1. Singh, R.L. & P.K. Dutt : Elements of Practical Geography Students trends.
2. Monkhouse, F.J. & H.R. Wilkinson; Maps and Diagrams Mathuen, London.
3. Mahmood, Aslam 1971 : Statistical Methods in Geographical studies Rajesh Pub., New Delhi.
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10. हीरालाल : प्रायोगिक भूगोल, किताबघर, कानपुर.
11. आर.सी. तिवारी एवं सुधाकर त्रिपाठी : अभिनव प्रयोगात्मक भूगोल, प्रयाग पुस्तक भवन, इलाहाबाद

27/05/19

27.5.19 (Dr. S. K. Das)

27.5.19

27.05.19 DR. R. Sharma

HEMCHNAD YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A. (Hindi) Semester Exam

UNDER

FACULTY OF ARTS

Session 2019-20

(Approved by Board of Studies)
Effective from June 2019

सत्र 2019–20 एम.ए. हिन्दी अंक विभाजन सेमेस्टर प्रणाली

प्रथम सेमेस्टर

अंक विभाजन

	प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
प्रथम :	(आदिकाल एवं पूर्व मध्यकाल)	80	20	100
द्वितीय :	प्राचीन एवं मध्यकालीन काव्य	80	20	100
तृतीय :	आधुनिक काव्य–1 (छायावाद एवं पूर्ववर्ती काव्य)	80	20	100
चतुर्थ :	नाटक, एकांकी एवं चरितात्मक कृति	80	20	100
			कुल	400 अंक

द्वितीय सेमेस्टर

अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
पंचम :(उत्तर मध्यकाल एवं आधुनिक काल)	80	20	100
षष्ठ : मध्यकालीन काव्य	80	20	100
सप्तम :आधुनिक काव्य–2 (प्रगतिवाद, प्रयोगवाद, नई कविता एवंसमकालीन कविता)	80	20	100
अष्टम : उपन्यास, निबंध एवं कहानी	80	20	100
		कुल	400 अंक

तृतीय सेमेस्टर

अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
प्रथम : साहित्य के सिद्धांत तथा अलोचना शास्त्र	80	20	100
द्वितीयः भाषा विज्ञान	80	20	100
तृतीयः कामकाजी हिन्दी एवं पत्रकारिता	80	20	100
चतुर्थ : भारतीय साहित्य	80	20	100
		कुल	400 अंक

चतुर्थ सेमेस्टर

अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
पंचमः हिन्दी आलोचना तथा समीक्षा शास्त्र	80	20	100
षष्ठ : हिन्दी भाषा	80	20	100
सप्तम : मीडिया लेखन एवं अनुवाद	80	20	100
अष्टमः जनपदीय भाषा और साहित्य (छत्तीसगढ़ी)	80	20	100
		कुल	400 अंक

टीपः– प्रत्येक प्रश्न पत्र में 20 अंकों के आंतरिक मूल्यांकन के अंतर्गत दो आंतरिक मूल्यांकन का आयोजन अनिवार्य होगा एवं इसका मूल्यांकन विभाग के शिक्षको के द्वारा किया जावेंगा तथा प्राप्तांक विश्वविद्यालय को प्रेषित किया जावेगा ।

एम.ए. – हिन्दी –2019–20
प्रथम सेमेस्टर
प्रश्न पत्र – प्रथम
हिन्दी साहित्य का इतिहास (आदिकाल एवं पूर्व मध्यकाल)

योग : 80

पाठ्य विषयः–

इकाई–1 **हिन्दी साहित्य का इतिहास : परम्परा और पद्धतिः**

हिन्दी साहित्य के इतिहास लेखन की परम्परा, साहित्येतिहास के पुनर्लेखन की समस्याएँ। हिन्दी साहित्य के इतिहास का काल–विभाजन और नामकरण, आदिकाल के नामकरण की समस्या।

इकाई–2 आदिकालः

हिन्दी साहित्य के आदिकाल की सांस्कृतिक पृष्ठभूमि, रासो काव्य, सिद्ध नाथ एवं जैन साहित्य, लौकिक साहित्य, साहित्यिक प्रवृत्तियाँ, प्रतिनिधि रचनाकार ।

इकाई–3 **पूर्व मध्यकाल (भक्ति काल), भक्ति आंदोलन :**

उद्‌भव और विकास, हिन्दी क्षेत्र में भक्ति आंदोलन की सांस्कृतिक पृष्ठभूमि एवं उसका विकास, भक्ति काल की प्रमुख प्रवृत्तियाँ, तथा दार्शनिक विचारधाराएँ।

इकाई–4 **भक्तिकाल की विभिन्न काव्य-धाराएँ :**

निर्गुण काव्य : ज्ञानमार्गी काव्यधारा एवं प्रेममार्गी काव्यधारा - परम्परा, प्रवृत्ति एवम उसका विकास। सगुण काव्य : कृष्ण भक्ति काव्य–धारा एवं रामभक्ति काव्य धारा- परंपरा, प्रवृति एवं उसका विकास।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	= 15 अंक
प्रश्न 2 –	1 X 15	= 15 अंक
प्रश्न 3 –	1 X 15	= 15 अंक
प्रश्न 4 –	1X 15	= 15 अंक
प्रश्न 5 – लघुत्तरीय	5 X 2	= 10 अंक
– वस्तुनिष्ठ	10 X 1	= 10 अंक

योग = 80 अंक

आंतरिक मूल्यांकन 20 अंक

निर्धारित पुस्तकें :–

1. हिन्दी साहित्य का इतिहास (संशोधित – आचार्य रामचंद्र शुक्ल)

2. हिन्दी साहित्य का आदिकाल – हजारी प्रसाद द्विवेदी

3. हिन्दी साहित्य का इतिहास (नेशनल पब्लिशिंग हाऊस, दिल्ली) – डॉ. नगेन्द्र

4. आदिकालीन हिन्दी साहित्य (वाराणसी विश्वविद्यालय प्रकाशन) – डॉ. शम्भूनाथ पाण्डेय

5. आदिकालीन हिन्दी साहित्य सांस्कृतिक पीठिका (हिन्दी ग्रंथ अकादमी) – डॉ. राममूर्ति त्रिपाठी

6. हिन्दी साहित्य का दुसरा इतिहास – डॉ. बच्चन सिंह

7. हिन्दी साहित्य और संवेदना का विकास–राम स्वरूप चतुर्वेदी (लोकभारती प्रकाशन)

8. हिन्दी साहित्य का सरल इतिहास – विश्वनाथ त्रिपाठी (ओरियन्ट लॉगमैन)

9. हिन्दी साहित्य उद्‌भव और विकास – हजारी प्रसाद द्विवेदी।

एम.ए. (हिन्दी) – 2019–20
प्रथम सेमेस्टर
प्रश्न पत्र – द्वितीय
प्राचीन एवं मध्यकालीन काव्य
(रासो काव्य, लौकिक काव्य एवं निर्गुण काव्य)

योग : 80

पाठ्य विषयः–

व्याख्या एवं विवेचन के लिए निम्नांकित चार कवियों का अध्ययन अपेक्षित है ।

1. चंदबरदाई : पृथ्वीराज रासो, संपादक आचार्य हजारी द्विवेदी, डॉ. नामवर सिंह (पद्मावती समय)
2. विद्यापति पदावली : संपादक रामवृक्ष बेनीपुरी से प्रारंभिक 10 पद।
3. कबीर ग्रंथावलीः संपादक डॉ. श्याम सुंदर दास (50 साखियाँ तथा 15 पद) पद क्रमांक– 11, 16, 24, 26, 27, 45, 49, 64, 70, 72, 89, 93, 110, 111, 268 साखियाँ– गुरूदेव कौ अंग 1 से 10, सुमिरण कौ अंग 1 से 10, विरह कौ अंग 1 से 10, ग्यान विरह कौ अंग 1 से 5, चितावणी कौ अंग 1 से 5, माया कौ अंग 1 से 5, परचा कौ अंग 1 से 5 ।
4. मलिक मोहम्मद जायसी : पद्मावत संपादक आ. रामचंद्र शुक्ल (नागमती विरह खण्ड एवं सिंहल द्वीपखण्ड)

टीपः– द्रुत पाठ हेतु निम्नांकित 05 कवियों का एवं उनकी रचनाओं का अध्ययन अनिवार्य है, इन कवियों पर लघुत्तरी प्रश्न पूछे जायेंगे– अमीर खुसरों, मीराबाई, रहीम, रैदास, रसखान ।

अंक विभाजन

प्रश्न 1 व्याख्या	3 व्याख्या (कोई तीन)	3X10 =	30 अंक
प्रश्न2 चंदबरदाई एवं इतिहास	3 आलोचनात्मक (कोई तीन)	3X10 =	30 अंक
प्रश्न3 कबीर एवं जायसी			
प्रश्न4 (द्रुत पाठ के कवि)	5 लघु– उतरीय (सम्पूर्ण पाठ्यक्रम से)	5X2 =	10 अंक
10 वस्तुनिष्ठ (सम्पूर्ण पाठ्यक्रम से)		10X1 =	10 अंक
	योग =		**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकेंः–

1. डॉ. विपिन बिहारी द्विवेदी – चंदबरदाई
2. कबीर की विचारधारा – डॉ. गोविन्द त्रिगुणायन
3. प्रमुख प्राचीन कवि – डॉ. द्वारिका प्रसाद सक्सेना
4. कबीर साहित्य की परख – परशुराम चतुर्वेदी
5. जायसी की विशिष्ट शब्दावली – डॉ. इंदिरा कुमारी सिंह का विश्लेशणात्मक अध्ययन
6. मलिक मोहम्मद जायसी और उनका काव्य – डॉ. शिवसहाय पाठक
7. अमीर खुसरों और उनका साहित्य – डॉ. भोलानाथ तिवारी
8. कबीर– सं. हजारी प्रसाद द्विवेदी

एम.ए.पूर्व (हिन्दी) 2019–20
प्रथम सेमेस्टर
प्रश्न पत्र – तृतीय
आधुनिककाव्य–1
(द्विवेदीयुगीन एवं छायावादी काव्य)

कुल : 80

पाठ्य विषयः–
व्याख्या एवं विवेचन के लिए निम्नांकित तीन कवियों का अध्ययन अपेक्षित है ।

इकाई 1. मैथिलीशरण गुप्त – साकेत नवम् सर्ग
इकाई 2. जयशंकर प्रसाद – कामायनी (चिन्ता, श्रद्धा)
इकाई 3. सूर्यकांत त्रिपाठी निराला – राम की शक्ति पूजा, सरोज स्मृति
इकाई 4. महादेवी वर्मा – मैं नीर भरी दुःख की बदली, यह मंदिर का दीप इसे नीरव जलने दो, रूपसी तेरा केश-पाश, मधुर मधुर मेरे दीपक जल।

टीपः– द्रुत पाठ हेतु निम्नांकित 5 कवियों का अध्ययन किया जाएगा ।
श्रीधर पाठक, अयोध्या सिंह उपाध्याय ''हरिऔध'', मुकुटधर पांडेय, जगन्नाथ दास रत्नाकर, सुमित्रानन्दन पंत, (लघुत्तरीय प्रश्न द्रुत पाठ एवं पाठ्यक्रम से पूछे जाएंगे।)

अंक विभाजन

प्रश्न1–	3 व्याख्या	–	3X10	=	30 अंक
प्रश्न2–	3 आलोचनात्मक	–	3X10	=	30 अंक
प्रश्न3–	5 लघुत्तरीय (द्रुत पाठ के कवि)	–	5X2	=	10 अंक
प्रश्न4–	वस्तुनिष्ठ अतिलघुत्तरीय	–	10X1	=	10 अंक
			योग	**=**	**80 अंक**
			आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. साकेत एक अध्ययन– डॉ. नगेन्द्र
2. कवि निराला – आचार्य नंद दुलारे वाजपेयी
3. निराला की साहित्य साधना – डॉ. रामविलास शर्मा
4. नया साहित्य नये साधना – आचार्य नंद दुलारे वाजपेयी
5. कामायनी एक पुनर्विचार – मुक्तिबोध
6. प्रसाद का काव्य – प्रेमशंकर
7. हिन्दी साहित्य आधुनिक परिदृश्य – अज्ञेय
8. हिन्दी साहित्य का इतिहास – नगेन्द्र
9. बच्चन की कविताओं का शैलीवैज्ञानिक अध्ययन – डॉ. शीला शर्मा

एम.ए. – (हिन्दी) –2019–20
प्रथम सेमेस्टर
प्रश्न पत्र – चतुर्थ
आधुनिक गद्य साहित्य
(नाटक, एकांकी एवं चरितात्मक तथा आत्मकथात्मक कृति)

पूर्णांक : 80

पाठ्य विषय :–

इकाई –1. नाटक

1. चन्द्रगुप्त	–	जयशंकर प्रसाद
2. हानूश	–	भीष्म साहनी
3. अन्धा युग	–	धर्मवीर भारती

इकाई –2. एकांकी

1. रीढ़ की हड्डी	–	जगदीश चन्द्र माथुर
2. एक दिन	–	लक्ष्मीनारायण मिश्र
3. ताँबे के कीड़े	–	भुवनेश्वर
4. तौलिए	–	उपेन्द्रनाथ अश्क

इकाई – 3. चरितात्मक कृति

1. पथ के साथी	–	निराला भाई
2. आवारा मसीहा (संक्षिप्त संस्करण)	–	विष्णु प्रभाकर

इकाई – 4. आत्मकथात्मक कृति

1. जूठन (भाग–एक)–ओम प्रकाश बाल्मिकी

इकाई विभाजन

प्रश्न – 1 – व्याख्या
प्रश्न – 2 – नाटक
प्रश्न – 3 – एकांकी
प्रश्न –4 – चरितात्मक कृति, आत्मकथात्मक कृति
प्रश्न –5 – लघुउत्तरीय एवं वस्तुनिष्ठ प्रश्न

अंक विभाजन

1– 3 व्याख्या	–	3X10	=	30 अंक
2– 3 आलोचनात्क	–	3X10	=	30 अंक
3– 5 लघुत्तरी	–	5X2	=	10 अंक
4– वस्तुनिष्ठ अतिलघुउत्तरीय	–	10X1	=	10 अंक
		योग	**=**	**80 अंक**

आंतरिक मूल्यांकन 20 अंक

निर्धारित पुस्तकेंः–

1. हिन्दी नाटक उद्‌भव और विकास – डॉ. दशरथ ओझा
2. हिन्दी नाटक सिद्धांत और विवेचन – डॉ. गिरीश रस्तोगी
3. हिन्दी नाटक पुनर्मूल्यांकन – डॉ. सत्येन्द्र तनेजा
4. समसामयिक हिन्दी नाटकों में चरित्र सृष्टि – डॉ. जयदेव तनेजा
5. प्रसाद के नाटकों का शास्त्रीय अध्ययन – जगन्नाथ प्रसाद शर्मा
6. आधुनिक हिन्दी नाटक – नगेन्द्र
7. नाटक रंगमंच और मोहन राकेश – डॉ. सुरेन्द्र यादव
8. प्रसाद युगीन हिन्दी नाटक – डॉ. भगवती प्रसाद शुक्ल
9. प्रसाद के नाटक एवं नाट्य शिल्प – डॉ. शांति स्वरूप गुप्त
10. नाटककार मोहन राकेश – डॉ. सुन्दर लाल कथूरिया
11. हिन्दी एकांकी : उद्‌भव और विकास – रामचरण महेन्द
12. हिन्दी रंगमंच : दषा और दिषा – जयदेव तनेजा
13. भष्म साहनी के उपन्यास और नाटक – डॉ. राकेश कुमार तिवारी

एम.ए. (हिन्दी) – 2019–20
द्वितीय सेमेस्टर
प्रश्न पत्र – पंचम (उत्तर मध्यकाल से आधुनिक काल तक)

समय 3 घंटे **पूर्णांक : 80**

पाठ्य विषयः–

इकाई 1. उत्तर मध्यकाल (रीतिकाल) काल सीमा, नामकरण, प्रवृत्तियॉ, रीतिकालीन साहित्य की विभिन्न धारायें (रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त) प्रवृत्तियॉ एवं विशेषताएं। रीतिकाल के प्रतिनिधि रचनाकार एवं रचनाएँ ।

इकाई 2. आधुनिक काल – आधुनिक काल की सामाजिक, राजनैतिक, आर्थिक एवं सांस्कृतिक पृष्ठभूमि । सन् 1857 की राज्य क्रांति एवं पुनर्जागरण, भारतेन्दु युग और हिन्दी नवजागरण – प्रमुख साहित्यकार, साहित्य एवं साहित्यिक विषेशताएँ ।

इकाई 3. द्विवेदी युग – प्रमुख साहित्यकार एवं साहित्यिक विषेशताएँ, छायावाद– नामकरण और प्रवृत्तियॉ, प्रमुख साहित्याकार, साहित्यिक विषेशताएँ। छायावादोत्तर काल (विभिन्न प्रवृत्तियॉ) प्रगतिवाद, नई कविता, नवगीतवाद तथा समकालीन कविता, स्वच्छन्दतावाद सामान्य परिचय ।

इकाई 4. हिन्दी गद्य का विकास – आधुनिक काल, गद्य साहित्य के विभिन्न रूपों का उद्भव और विकास, उपन्यास व कहानी का विकास और सामान्य प्रवृत्तियॉ, निबंध का विकास और प्रवृत्तियॉ, नाटक का उद्भव और विकास– सामान्य प्रवृत्तियॉ, गीति– नाटकों का परिचयात्मक विवेचन ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 2	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 3	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 4	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 5	– लघुत्तरीय		5X 2	= 10 अंक
प्रश्न 6	– वस्तुनिष्ठ		10X 1	= 10 अंक

योग = 80 अंक

आंतरिक मूल्यांकन 20 अंक

निर्धारित पुस्तकें :–

1. आधुनिक साहित्य की प्रवृत्तियॉ – डॉ. नामवर सिंह
2. हिन्दी साहित्य बीसवीं शताब्दी – नन्ददुलारे वाजपेयी
3. आधुनिक हिन्दी साहित्य का इतिहास – कृष्ण शंकर शुक्ल
4. गद्य की विविध विधाएँ – डॉ. बापूराव देसाई
5. हिन्दी कहानी – उद्भव और विकास – डॉ. सुरेश सिन्हा
6. हिन्दी उपन्यास की प्रवृत्तियॉ – डॉ. शशि भूषण सिंह
7. हिन्दी नाटक उद्भव और विकास – डॉ. दशरथ ओझा
8. हिन्दी साहित्य का इतिहास – आचार्य रामचन्द्र शुक्ल
9. हिन्दी साहित्य का उद्भव और विकास – आचार्य हजारी प्रसाद द्विवेदी
10. हिन्दी साहित्य की भूमिका – आचार्य हजारी प्रसाद द्विवेदी

एम.ए. (हिन्दी) – 2019–20
द्वितीय सेमेस्टर
प्रश्न पत्र –षष्ठ
मध्यकालीन काव्य

समय 3 घंटे **पूर्णांक : 80**

पाठ्य विषयः– व्याख्या एवं विवेचन के लिए निम्नांकित तीन कवियों का अध्ययन किया जाएगा।

इकाई –1. सूरदास –भ्रमरगीत सार – संपादक आचार्य रामचंद्र शुक्ल (50 पद) पद संख्या – 1 से 10, 21 से 30, 51 से 60, 61 से 70, 81 से 90 तक (50 पद)

इकाई – 2. तुलसीदास –रामचरित मानस (सुंदरकाण्ड) गीताप्रेस गोरखपुर

इकाई – 3. बिहारी –बिहारी रत्नाकर संपादक जगन्नाथ दास रत्नाकर (प्रारंभिक 100 दोहे)

इकाई – 4. द्रुत पाठ हेतु निम्नांकित 5 कवियों एवं उनकी रचनाओं का (विषय एवं शिल्पगत) ज्ञान अपेक्षित है केशव, भूषण, पद्माकर, देव, घनानंद

इन कवियों पर लघुत्तरीय प्रश्न पूछे जाएंगे ।

अंक विभाजन

प्रश्न 1	व्याख्या	3 व्याख्या	3X10	=	30 अंक
प्रश्न 2	सूरदास, तुलसीदास	आलोचनात्मक	3X10	=	30 अंक
		3			
प्रश्न 3	बिहारी एवं इतिहास विषयक	प्रश्न			
प्रश्न 4	द्रुत पाठ के कवि	5 लघुत्तरी	5X2	=	10 अंक
प्रश्न 5	वस्तुनिष्ठ प्रश्न (संपूर्ण पाठ्यक्रम से)	10 वस्तुनिष्ठ अतिलघुत्तरीय	10X1	=	10 अंक
			योग	=	**80 अंक**
		आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकें :–

1. बिहारी– डॉ. विश्वनाथ प्रसाद मिश्र
2. तुलसीदास और उनका युग संदर्भ – डॉ. भगीरथ मिश्र
3. सूरदास के काव्य का मूल्यांकन – डॉ. रामरतन भटनागर
4. तुलसी साहित्य के नये संदर्भ – डॉ. एल.एन.दुबे
5. सूरदास – डॉ. हरबंस लाल वर्मा
6. तुलसीदास – प्रो. सतीश कुमार अशोक प्रकाशन नई दिल्ली
7. सूरदास – मैनेजर पाण्डेय

एम.ए. – (हिन्दी) 2019–20
द्वितीय सेमेस्टर
प्रश्न पत्र – सप्तम
आधुनिककाव्य–2
(प्रगतिवाद, प्रयोगवाद, नई कविता एवं समकालीन कविता)

कुल अंक : 80

पाठ्य विषय–

स.ही.वात्स्यायन अज्ञेय	–	नदी के द्वीप, असाध्यवीणा, बावरा अहेरी, कलगी बाजरे की, यह दीप अकेला, उधार, देह वल्ली, सोन मछली
ग.मा. मुक्तिबोध	–	कविता – अंधेरे में ।
नागार्जुन	–	बसन्त की अगवानी,यह तुम थी, कोयल आज बोली है, शासन की बंदूक, सिन्दूर तिलकित भाल, अकाल और उसके बाद, बादल को घिरते देखा।
रघुवीर सहाय	–	रामदास, मेरा जीवन, हंसो–हंसो जल्दी हंसों, पानी–पानी

द्रुत पाठ हेतु निम्नांकित 5 कवियों का अध्ययन किया जायेगा ।
केदारनाथ अग्रवाल, त्रिलोचन शास्त्री, भवानी प्रसाद मिश्र, विनोद कुमार शुक्ल, धूमिल
(लघुत्तरी प्रश्न द्रुत पाठ एवं सम्पूर्ण पाठ्यक्रम से पूछे जायेंगे)

अंक विभाजन

प्रश्न 1. 3 व्याख्या	–	3X10	=	30 अंक
प्रश्न 2. 3 आलोचनात्मक	–	3X10	=	30 अंक
प्रश्न 3. 5 लघुत्तरीय	–	5X2	=	10 अंक
प्रश्न 4. 10 वस्तुनिष्ठ अतिलघुत्तरीय	–	10X1	=	10 अंक
		योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें :–

1. मुक्तिबोध की काव्य प्रक्रिया – अशोक चक्रधर
2. अज्ञेय का रचना संसार – डॉ. रामस्वरूप चतुर्वेदी
3. कविता की तीसरी आंख – डॉ. प्रभाकर श्रोत्रिय
4. कविता से साक्षात्कार – मलयज
5. हिन्दी साहित्य का इतिहास – डॉ. रामचन्द्र शुक्ल
6. कविता की संगत – विजय कुमार
7. कविता का अर्थात्– परमानंद श्रीवास्तव
8. नागार्जुन का रचना संसार – विजय बहादुर सिंह
9. छायावादोत्तर प्रबंध काव्यों में ऐतिहासिक, सांस्कृतिक एवं दार्शनिक तत्वों का अनुशीलन – डॉ. ज्योति पाण्डेय
10. छायावादोत्तर काव्यों की विभिन्न प्रवृत्तियों एवं उनका चैन्तनिक पक्ष – डॉ. ज्योति पाण्डेय

द्वितीय सेमेस्टर

प्रश्न पत्र – अष्टम

आधुनिक गद्य साहित्य (उपन्यास, निबंध एवं कहानी)

पाठ्य विषयः– **पूर्णांक : 80**

उपन्यास	–	1. गोदान	– प्रेमचंद
		2. बाणभट्ट की आत्मकथा	– हजारी प्रसाद द्विवेदी
निबंध	–	1. चढ़ती उमर	– बालकृष्ण भट्ट
		2. कविता क्या है?	– रामचंद्र शुक्ल
		3. माटी की मूरतें	– रामवृक्ष बेनीपुरी
		4. चन्द्रमा मनसो जातः	– विद्यानिवास मिश्र
		5. वैष्णव की फिसलन	– हरिशंकर परसाई
कहानी	–	1. उसने कहा था	– चन्द्रधर शर्मा गुलेरी
		2. पुरस्कार	– जयशंकर प्रसाद
		3. शतरंज के खिलाड़ी	– प्रेमचंद
		4. वापसी	– उषा प्रियम्वदा
		5. डिप्टी कलक्टरी	–अमरकांत

अंक विभाजन

प्रश्न 1. 3 व्याख्या	–	3X10	=	30 अंक
प्रश्न 2. 3 आलोचनात्मक प्रश्न	–	3X10	=	30 अंक
प्रश्न 3. 5 लघुत्तरीय प्रश्न	–	5X2	=	30 अंक
प्रश्न 4. 10 वस्तुनिश्ठ प्रश्न	–	10X1	=	10 अंक
		योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. प्रेमचंद और उनका युग	–	रामविलास शर्मा
2. गोदान के अध्ययन की समस्याएं	–	डॉ. गोपाल राय
3. कथाकार फणीश्वरनाथ रेणु	–	चंद्रभाव सोनवठी
4. हिन्दी उपन्यास की शिल्पविधि का विकास	–	सिद्धनाथ तनेजा
5. हिन्दी उपन्यास उद्‌भव और विकास	–	सुरेश सिन्हा
6. प्रेमचंद : एक अध्ययन	–	राजेश्वर गुरू
7. महादेवी प्रतिनिधि गद्य रचनाएं	–	सं. रामजी पाण्डेय
8. हिन्दी निंबध के आधार स्तम्भ	–	डॉ. हरिमोहन
9. हिन्दी कहानी : उद्‌भव और विकास	–	सुरेश सिन्हा
10. कहानी : स्वरूप और संवेदना	–	राजेन्द्र यादव
11. कहानी : नयी कहानी	–	नामवर सिंह
12. हजारी प्रसाद द्विवेदी	–	सं. विश्वनाथ तिवारी
13. प्रेमचंद का जीवनदर्शन एवं रंगभूमि	–	डॉ. शंकर बुन्देले

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तृतीय सेमेस्टर
प्रश्न पत्र – प्रथम
साहित्य के सिद्धांत तथा आलोचना शास्त्र

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 भारतीय काव्य शास्त्र
काव्य लक्षण, काव्य हेतु, काव्य प्रयोजन और काव्य के प्रकार
रस सिद्धांत, रस का स्वरूप, रस निष्पत्ति और साधारणीकरण, रस के अंग ।

इकाई–2 अलंकार सिद्धांत रीति सिद्धांत, वक्रोक्ति सिद्धांत, ध्वनि सिद्धांत और औचित्य सिद्धांत

इकाई–3 पाश्चात्य काव्य शास्त्र प्लेटो – काव्य सिद्धांत अरस्तू– अनुकरण का सिद्धांत, विरेचन सिद्धांत, लोंजाइनस–उदात्त की अवधारणा

इकाई–4 मैथ्यू आर्नल्ड– कला की अवधारणा टी.एस. इलियट – कला की निर्वैयक्तिकता, कॉलरिज–कल्पना सिद्धांत

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1	–	1X 15	=	15 अंक
प्रश्न 2	–	1X 15	=	15 अंक
प्रश्न 3	–	1X 15	=	15 अंक
प्रश्न 4	–	1X 15	=	15 अंक
प्रश्न 5	– लघुत्तरीय	5X 2	=	10 अंक
प्रश्न 6	– वस्तुनिष्ठ	10X1	=	10 अंक
		योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

1. डॉ. गणपति चन्द्रगुप्त – भारतीय एवं पाश्चात्य काव्य सिद्धांत
2. डॉ. भगीरथ मिश्र – पाश्चात्य काव्य शास्त्र, इतिहास, सिद्धांत एवं वाद
3. डॉ. राममूर्ति त्रिपाठी– भारतीय काव्य शास्त्र के नये क्षितिज
4. डॉ. शिवकुमार मिश्र– मार्क्सवादी साहित्य के सिद्धांत
5. डॉ. नगेन्द्र – भारतीय काव्य शास्त्र की भूमिका
6. डॉ. निर्मला जैन – पाश्चात्य साहित्य चिंतन
7. मुलजी भाई– भारतीय और पाश्चात्य काव्य शास्त्र
8. डॉ. गंगा प्रसाद विमल – आधुनिकता, साहित्य के संदर्भ में ।

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तृतीय सेमेस्टरप्रश्न पत्र – द्वितीय
(भाषा विज्ञान)

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 भाषा और भाषा विज्ञान, भाषा की परिभाषा और अभिलक्षण, भाषा व्यवस्था और भाषा व्यवहार, भाषा संरचना, भाषा विज्ञान स्वरूप एवं व्याप्ति, अध्ययन की दिशाएँ–वर्णनात्मक, ऐतिहासिक और तुलनात्मक ।

इकाई–2 स्वन प्रक्रिया : स्वन विज्ञान का स्वरूप और शाखाएँ, वागवयव और उनके कार्य, स्वन की अवधारणा और स्वनों का वर्गीकरण, स्वन गुण, स्वनिक परिवर्तन। स्वनिम विज्ञान का स्वरूप, स्वनिम की अवधारणा, स्वनिम के भेद ।

इकाई–3 व्याकरण : रूप विज्ञान का स्वरूप और शाखाएँ, रूपिम की अवधारणा और भेद, मुक्त – आबद्ध अर्थदर्शी और संबंधदर्शी रूपिम और शाखाएँ, रूपिम के भेद और प्रकार्य। वाक्य के भेद, वाक्य–विश्लेशण, निकटस्थ अवयव विश्लेषण ।

इकाई–4 अर्थ विज्ञान : अर्थ की अवधारणा, शब्द और अर्थ का संबंध, पर्यायता, अनेकार्थता, विलोमता अर्थ परिवर्तन।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. सामान्य भाषा विज्ञान– डॉ. बाबूराम सक्सेना
2. भाषा विज्ञान – डॉ. भोलानाथ तिवारी
3. भारत के भाषा परिवार – डॉ. रामनिवास शर्मा
4. भाषाशास्त्र की रूपरेखा – उदयनारायण तिवारी
5. हिन्दी शब्दानुशासन – किशोरी दास बाजपेयी
6. भाषा विज्ञान और भाषा शास्त्र – कपिलदेव द्विवेदी
7. सामान्य भाषाविज्ञान – बाबूराम सक्सेना
8. हिन्दी और उसका संक्षिप्त इतिहास – भोलानाथ तिवारी
9. हिन्दी और उसकी विविध बोलियॉ – प्रो. दीपचंद जैन
10. भाषा विज्ञान के सिद्धांत और हिन्दी भाषा – द्वारिका प्रसाद मिश्र

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तृतीय सेमेस्टर प्रश्न
पत्र – तृतीय
(कामकाजी हिन्दी एवं पत्रकारिता)

पाठ्य विषयः– **पूर्णांक : 80**

इकाई–1 हिन्दी के विभिन्न रूप– सर्जनात्मक भाषा, संचार भाषा, राजभाषा, माध्यम भाषा, कार्यालयीन हिन्दी (राजभाषा) के प्रमुख प्रकार्य– प्रारूपण, पत्र लेखन, संक्षेपण, पल्लवन, टिप्पणी ।

इकाई–2 पारिभाषिक शब्दावली, स्वरूप एवं महत्व, पारिभाषिक शब्दावली निर्माण के सिद्धांत, ज्ञान–विज्ञान के विभिन्न क्षेत्रों की पारिभाषिक शब्दावली। हिन्दी कम्प्यूटर– कम्प्यूटर परिचय, उपयोगिता क्षेत्र, वेब पेज पब्लिशिंग परिचय।

इकाई–3 इंटरनेट संपर्क उपकरणों का परिचय, प्रकार्यात्मक रख–रखाव एवं इंटरनेट समय मितव्यतता के सूत्र । इंटरनेट एक्सप्लोइट अथवा नेट स्केप । हिन्दी साफ्टवेयर पैकेज ।

इकाई–4 पत्रकारिता का स्वरूप एवं प्रकार, हिंदी पत्रकारिता का संक्षिप्त इतिहास । समाचार लेखन कला, संपादन के आधारभूत तत्व, व्यवहारिक प्रूफशोधन, शीर्शक संरचना, लीड, इंट्रो एवं शीर्षक, संपादकीय लेखन, पृष्ठ सज्जा, साक्षात्कार, पत्रकारवार्ता एवं प्रेस प्रबंधन, प्रमुख प्रेस कानून एवं आचार संहिता ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. प्रयोजन परक हिन्दी	–	प्रो. सूर्यप्रसाद दीक्षित
2. प्रशासनिक हिन्दी	–	पुष्पा कुमारी, क्लासिक पब्लिक कम्पनी
3. पत्रकारिता के छह दशक	–	जगदीष प्रसाद चतुर्वेदी
4. हिन्दी पत्रकारिता का प्रतिनिधि संकलन	–	तरूशिखा सुरजन, राजकमल प्रकाशन, नई दिल्ली
5. हिन्दी पत्रकारिता	–	कृष्ण बिहारी मिश्र
6. भारतीय समाचार पत्रों का संगठन एवं प्रबंधन	–	डॉ. सुकुमार जैन
7. पत्रकारिता का इतिहास एवं जनसंचार माध्यम	–	डॉ. संजीव भनावत
8. कम्प्यूटर के भाषिक अनुप्रयोग	–	विजय मल्होत्रा
9. कम्प्यूटर एप्लीकेशन	–	गौरव अग्रवाल

एम.ए. – (हिन्दी साहित्य) 2019–20
तृतीय सेमेस्टर
प्रश्न पत्र – चतुर्थ
भारतीय साहित्य

पूर्णांक : 80

पाठ्य विषय :–

इकाई–1 भारतीय साहित्य का स्वरूप, भारतीय साहित्य के अध्ययन की समस्याएँ, भारतीय साहित्य में आज के भारत का बिम्ब, हिन्दी साहित्य में भारतीय मूल्यों की अभिव्यक्ति ।

इकाई–2 हिन्दीतर साहित्य का इतिहास जो तीन वर्गों में विभक्त है –

1. दक्षिणात्य भाषा वर्ग से मलयालम
2. पूर्वांचल भाषा वर्ग में बँगला
3. पश्चिमोत्तर भाषा वर्ग में मराठी

प्रत्येक विद्यार्थी इन तीनों विकल्पों में से एक भाषा चयन करेंगे बशर्ते वह भाषा अपनी क्षेत्रीय भाषा से भिन्न भाषा वाले वर्ग से संबंधित हो। विद्यार्थी एक भाषा वर्ग (मलयालम, बंगला, मराठी) में से किसी एक के इतिहास एवं हिन्दी भाषा साहित्य से उस भाषा साहित्य का तुलनात्मक अध्ययन करेंगे।

इकाई–3 उपन्यास – अग्निगर्भ (बंगला– महाश्वेता देवी)

इकाई– 4 नाटक – हयवदन (कन्नड़–गिरीशकर्नाड)

कविता संग्रह – कोच्चि के दरख्त (मलयालम– के.जी. शंकर पिल्लै)

इकाई तीन तथा चार के अंतर्गत केवल आलोचनात्मक प्रश्न पूछे जाएँगे ।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें :–

1. मलयालम साहित्य – परख और पहचान – प्रो. आर. सुरेन्द्रन ।
2. राष्ट्रीय चेतना और मलयालम साहित्य – प्रो. आर. सुरेन्द्रन ।
3. मराठी भाषा और साहित्य – राजमल वोरा
4. मलयालम साहित्यकारों से साक्षात्कार – प्रो. आर. सुरेन्द्रन ।
5. बंगला भाषा और साहित्य का इतिहास – भारतीय भाषा संस्थान, इलाहाबाद
6. भारतीय साहित्य – डॉ. नगेन्द्र
7. भारतीय साहित्य रत्नमाला – सं.कृष्णदयाल भार्गव
8. भारतीय साहित्य के इतिहास की समस्याएँ – डॉ. रामविलास शर्मा
9. भारतीय भाषाओं के साहित्य का इतिहास – केन्द्रीय हिन्दी निर्देशालय, दिल्ली ।
10. भारतीय साहित्य : अवधारणा, समन्वय एवं सादृश्यता– जगदीश गुप्त

एम.ए. – (हिन्दी) 2019–20
चतुर्थ सेमेस्टर
प्रश्न पत्र – पंचम
(हिन्दी आलोचना तथा समीक्षा शास्त्र)

पूर्णांक : 80

पाठ्य विषयः–

इकाई 1 मनोविश्लेशण वाद, अस्तित्ववाद, अभिजात्यवाद, स्वच्छंदतावाद, अभिव्यंजनावाद, मार्क्सवाद, आधुनिक समीक्षा की विशिष्ट प्रवृत्तियॉ, संरचनावाद, शैलीविज्ञान, उत्तर आधुनिकता

इकाई 2 हिन्दी कवि आचार्यों का काव्य शास्त्रीय चिंतन– लक्षण काव्य परम्परा – आचार्य रामचन्द्र शुक्ल, आचार्य नंददुलारे वाजपेयी, डॉ. रामविलास शर्मा

इकाई 3 आधुनिक हिन्दी आलोचना का विकास एवं उसकी प्रमुख प्रवृत्तियॉ–शास्त्रीय, ऐतिहासिक, मनोविश्लेषणवादी, सौंदर्य शास्त्रीय

इकाई 4 व्यावहारिक समीक्षा : काव्यांश की स्वविवेक के अनुसार व्याख्या

अंक विभाजन

प्रश्न 1 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 2 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 3 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 4 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 5 – लघुत्तरीय	5X2	=	10 अंक
प्रश्न 6 – वस्तुनिष्ठ	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकें :–

1. डॉ. गोविंद त्रिगुणायत –शास्त्रीय समीक्षा के सिद्धांत भाग 1 एवं 2
2. डॉ. भगवत स्वरूप मिश्र – हिन्दी आलोचना : उद्‌भव और विकास
3. डॉ. रामेश्वर खण्डेलवाल – हिन्दी आलोचना के आधार स्तम्भ
4. डॉ. शिवकरण सिंह – आलोचना के बदलते मानदण्ड और हिन्दी साहित्य
5. डॉ. नंदकिशोर नवल – हिन्दी आलोचना का विकास
6. योगेन्द्र शाही – अस्तित्ववाद किर्कगार्द से कामू तक
7. रणधीर सिन्हा – आलोचनात्मक रामविलास शर्मा

एम.ए. – (हिन्दी) 2019–20
चतुर्थ सेमेस्टर
प्रश्न पत्र –षष्ठ
(हिन्दी भाषा)

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 हिन्दी की ऐतिहासिक पृष्ठभूमि : प्राचीन भारतीय आर्य भाशाएँ – वैदिक तथा लौकिक संस्कृत और उनकी विषेशताएँ । मध्यकालीन भारतीय आर्यभाषाएँ – पालि, प्राकृत, शौरसेनी, अर्धमागधी, मागधी, अपभ्रंश और उनकी विशेषताएँ । आधुनिक भारतीय भाषाएँ और उनका वर्गीकरण ।

इकाई–2 हिन्दी का भौगोलिक विस्तार – हिन्दी की उपभाषाएँ, पश्चिमी हिन्दी, पूर्वी हिन्दी, राजस्थानी, बिहारी तथा पहाड़ी और उनकी बोलियॉ। खड़ी बोली, ब्रज और अवधी की विशेषताएँ।

इकाई–3 हिन्दी के विविध रूप– संपर्क भाषा, राष्ट्रभाषा, राजभाषा के रूप में हिन्दी, माध्यम भाषा, संचार भाषा, हिन्दी की संवैधानिक स्थिति ।

इकाई–4 हिन्दी में कम्प्यूटर सुविधाएँ – आंकड़ा संसाधन और शब्द संसाधन, वर्तनी शोधक, मशीनी अनुवाद, हिन्दी भाष शिक्षण । देवनागरी लिपि : विशेषताएँ और मानकीकरण ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –		1X 15	=	15 अंक
प्रश्न 2 –		1X 15	=	15 अंक
प्रश्न 3 –		1X 15	=	15 अंक
प्रश्न 4 –		1X 15	=	15 अंक
प्रश्न5 –	लघुत्तरीय	5X 2	=	10 अंक
प्रश्न6 –	वस्तुनिष्ठ	10X 1	=	10 अंक
		योग	=	**80 अंक**
	आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकें:–

1. हिन्दी भाषा का संक्षिप्त इतिहास – भोलानाथ तिवारी
2. हिन्दी और उसकी विविध बोलियॉ – प्रो. दीपचंद जैन
3. भाषा भूगोल – कैलाशचंद भटिया हिन्दी समिति उ.प्र. शासन लखनऊ
4. हिन्दी भाषा की रूप संरचना – भोलानाथ तिवारी
5. राष्ट्रभाषा हिन्दी समस्याएँ और समाधान – देवेन्द्रनाथ शर्मा
6. नागरी लिपि और हिन्दी – अनंत चौधरी
7. सामान्य भाषा विज्ञान – डॉ. बाबूराम सक्सेना
8. भाषा विज्ञान – डॉ. भोलानाथ तिवारी

एम.ए. – (हिन्दी) 2019–20
चतुर्थ सेमेस्टर
प्रश्न पत्र – सप्तम
(मीडिया–लेखन एवं अनुवाद)

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 मीडिया लेखन जनसंचार : प्रौद्योगिक एवं चुनौतियॉ, विभिन्न जनसंचार–माध्यमों का स्वरूप– मुद्रण, श्रवण, दृश्य–श्रव्य, इंटरनेट, श्रवण–माध्यम (रेडियो), मौखिक भाषा की प्रकृति । समाचार लेखन एवं वाचन, रेडियो नाटक, उद्घोषणा लेखन, विज्ञापन–लेखन, फीचर तथा रिपोर्ताज ।

इकाई–2 दृश्य–श्रव्य माध्यम (फिल्म, टेलीविजन एवं रेडियो), दृश्य–माध्यमों में भाषा की प्रकृति, दृश्य एवं श्रव्य सामग्री का सामंजस्य, पार्श्व वाचन (वॉयस ओवर) पटकथा–लेखन, टेली–ड्रामा, संवाद–लेखन, साहित्य की विधाओं का दृश्य माध्यमों में रूपान्तरण, विज्ञापन की भाषा ।

इकाई–3 अनुवाद – सिद्धांत एवं व्यवहार अनुवाद का स्वरूप, क्षेत्र, प्रक्रिया एवं प्रविधि । हिन्दी की प्रयोजनीयता में अनुवाद की भूमिका । कार्यालयीन हिन्दी और अनुवाद, जनसंचार माध्यमों का अनुवाद, विज्ञापन में अनुवाद, वैचारिक साहित्य का अनुवाद, वाणिज्यिक अनुवाद, वैज्ञानिक तकनीकी तथा प्रौद्योगिकी क्षेत्रों में अनुवाद, विधि साहित्य की हिन्दी और अनुवाद।

इकाई–4 व्यावहारिक अनुवाद अभ्यास, कार्यालयीन अनुवाद, कार्यालयीन एवं प्रशासनिक शब्दावली, प्रशासनिक प्रयुक्तियॉ, पदनाम, विभाग, आदि पत्रों के अनुवाद, पदनामों–अनुभागों–दस्तावेजों–प्रतिवेदनों के अनुवाद, साहित्यिक अनुवाद के सिद्धांत एवं व्यवहार–कविता, कहानी, नाटक, सारानुवाद, दुभाषिया–प्रविधि ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक (पांच लघुत्तरीय)
प्रश्न 6 –	10X 1	=	10 (दस वस्तुनिश्ठ)
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. जनसंचार माध्यमों में हिन्दी – डॉ. चन्द्रकुमार (क्लासिकल पब्लिक कंपनी)
2. जनमाध्यम एवं पत्रकारिता – प्रवीण दीक्षित (सहयोगी साहित्य संस्थान)
3. पत्रकारिता का इतिहास एवं जनसंचार माध्यम– डॉ. संजीव भागवन्त (उ.प्र. जयपुर)
4. पत्रकारिता के विविध आयाम – वेदप्रताप वैदिक
5. दूरदर्शन : हिन्दी के प्रयोनमूलक विविध प्रयोग : डॉ. कृष्णकुमार रत्तू (मीनाक्षी प्रकाशन, जयपुर)
6. जनमाध्यम एवं पत्रकारिता – प्रवीण दीक्षित (सहयोगी साहित्य संस्थान)
7. अनुवाद के सिद्धांत – सुरेश कुमार
8. अनुवाद सिद्धांत की रूपरेखा – सुरेश कुमार
9. अनुवाद – बोध – डॉ. गार्गी गुप्त (भारतीय अनुवाद परिषद् दिल्ली)

एम.ए. – (हिन्दी) – 2019–20
चतुर्थ सेमेस्टर
प्रश्न पत्र – अष्टम
जनपदीय भाषा और साहित्य (छत्तीसगढ़ी)

पूर्णांक : 80

पाठ्य विषय :–

इकाई–1 छत्तीसगढ़ी भाषा–भौगोलिक सीमा, नामकरण, भाषिक स्वरूप एवं व्याकरणिक विशेषताएँ।

इकाई–2 छत्तीसगढ़ी साहित्य की युग प्रवृत्तियॉ एवं इतिहास ।

इकाई–3 छत्तीसगढ़ी कविता एवं कवि –

(1) सुंदरलालशर्मा
(2) मुकुटधर पाण्डेय
(3) हरि ठाकुर
(4) डॉ. नरेन्द्र देव वर्मा

इकाई–4 छत्तीसगढ़ी नाटक एवं उपन्यास

1. करमछड़हा (नाटक) – डॉ. खूबचंद बघेल
2. आवा (उपन्यास) – परदेशीराम वर्मा

द्रुतपाठ हेतु निम्नलिखित रचनाकार का अध्ययन (पांच लघुत्तरीय प्रश्न पूछे जायेंगे)

(1) लखन लाल गुप्त (2) लक्ष्मण मस्तुरिहा
(3) केयूर भूषण (4) मुकुन्द कौशल
(5) लोचन प्रसाद पाण्डेय (6) लाला जगदलपुरी
(7) पवन दीवान (8) कोदूराम दलित

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न4 –	1X 15	=	15 अंक
प्रश्न5 –	5X2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. छत्तीसगढ़ी भाषा का उद्‌विकास – डॉ. नरेन्द्र देव वर्मा
2. छत्तीसगढ़ी, हलबी, भतरी भाषाओं का भाषा वैज्ञानिक अध्ययन – भालचंद्र राव तैलंग
3. छत्तीसगढ़ी परिचय– डॉ. बलदेव मिश्र
4. छत्तीसगढ़ी लोकसाहित्य का अध्ययन – दयाशंकर शुक्ल
5. छत्तीसगढ़ी लोकजीवन और लोकसाहित्य का अध्ययन – डॉ. शकुन्तला वर्मा
6. छत्तीसगढ़ी भाषा का शास्त्रीय अध्ययन– डॉ. शंकर शेष
7. प्राचीन छत्तीसगढ़ी बोली – प्यारेलाल गुप्त
8. छत्तीसगढ़ी लोक साहित्य और भाषा – डॉ. बिहारीलाल साहू
9. छत्तीसगढ़ी भाषा और साहित्य – डॉ. सत्यभामा आडिल
10. छत्तीसगढ़ के साहित्यकार – देवीप्रसाद वर्मा
11. मानक छत्तीसगढ़ी व्याकरण – चंद्रकुमार चंद्राकर

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A. (Political Science) Semester Exam

UNDER

FACULTY OF SOCIAL SCIENCE

Session 2019-21

(Approved by Board of Studies)
Effective from June 2019

M.A. Political Science

Semester-I and semester-II

PAPER	SEMESTER-I	MARKS		SEMESTER-II	MARKS	
		Theory	Internal		Theory	Internal
I	भारतीय राजनीतिक चिंतन (Indian Political Thought)	80	20	पाश्चात्य राजनीतिक चिंतन (Western Political Thought)	80	20
II	भारतीय शासन एवं राजनीति (Indian Government and Politics)	80	20	भारत के राज्यों की राजनीति (State Politics in India)	80	20
III	तुलनात्मक राजनीति (Comparative Politics)	80	20	विकासशील देशों की तुलानात्मक राजनीति (Comparative Politics of Development Countries)	80	20
IV	अंतर्राष्ट्रीय संगठन (International Organization)	80	20	भारत की विदेशनीति (Indian Foreign Policy)	80	20
Total=400				Total=400		

M.A. Political Science

Semester III and Semester IV

PAPER	SEMESTER-III	MARKS		SEMESTER-IV	MARKS	
		Theory	Internal		Theory	Internal
I	अंतर्राष्ट्रीय राजनीति के सिद्धांत (Principal of International Politics)	80	20	अंतर्राष्ट्रीय राजनीति के समकालीन मुद्दे (Contemporary issues of International Politics)	80	20
II	लोकप्रशासन भाग–1 (Public Administration Part-I)	80	20	लोकप्रशासन भाग–2 (Public Administration Part-II)	80	20
III	शोध प्रविधि भाग–1 (Research Methodology Part-I)	80	20	शोध प्रविधि भाग–2 (Research Methodology Part-II)	80	20
IV	छत्तीसगढ़ का शासन एवं राजनीति (Government and Politics of Chhattisgarh)	80	20	राजनीतिक विचारधाराएं एवं आधुनिक राजनीतिक चिंतन (Political Ideologiese and Modern Political Thought.)	80	20
	Total=400			Project work VIVA-VOCE		
				Total=500		

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नियमावली–

1. उपर्युक्त समस्त प्रश्न पत्र अनिवार्य होंगे।
2. प्रत्येक प्रश्न पत्र में (सभी सेमेस्टर में) सैद्धान्तिक परीक्षा में 80 पूर्णांक होगा और 20 अंको का आन्तरिक मूल्यांकन होगा। इस प्रकार सभी प्रश्न पत्र में पूर्णांक 100 होगा।
3. प्रत्येक प्रश्न पत्र में आन्तरिक मूल्यांकन होगा की दो परीक्षाएं होगी जिसके सर्वोच्च अंक विश्वविद्यालय के प्रेषित किए जाएंगे।
4. प्रथम, द्वितीय और तृतीय सेमेस्टर में पूर्णांक 400 होगा। चतुर्थ सेमेस्टर में पूर्णांक 500 होगा।
5. एम. ए. चतुर्थ सेमेस्टर में 100 अंको की मौखिक परीक्षा होगी जिसमें 50 अंक परियोजना कार्य पर होगें और 50 अंको की मौखिक परीक्षा होगी।
6. परियोजना कार्य – कौशल विकास, रोजगार मुखी, ग्रामीण विकास, देश के महापुरूष, प्रमुख राजनीतिज्ञ, राष्ट्रपति, प्रधानमंत्री, छत्तीसगढ़ की राजनीति और शासन व्यवस्था पर आधारित होगा।
7. इस प्रकार एम.ए. राजनीति विज्ञान में कुल पूर्णांक 1700 होगा।
8. प्रत्येक प्रश्न पत्र 4 इकाइयों में विभाजित होगा।

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एम.ए. (राजनीति विज्ञान–प्रथम सेमेस्टर)

M.A. (Political Science-First Semester)

प्रथम प्रश्न पत्र

भारतीय राजनीतिक चिंतन

(Indian Political Thought)

इकाई–1	कौटिल्य, स्वामी विवेकानंद, बालगंगाधर तिलक के विचार (KAUTILYA, SWAMI VIVEKANAND AND BAL GANGADHAR TILAK)
इकाई–2	डॉ. भीमराव अम्बेडकर, महात्मा गांधी, गोपाल कृष्ण गोखले के विचार (THOUGHT OF DR. BHIMRAO AMBEDKAR, MAHATMA GANDHI AND GOPAL KRISHNA GOKHLE)
इकाई–3	राजाराम मोहन राय, राममनोहर लोहिया, मानवेन्द्र नाथ राय, जयप्रकाश नारायण के विचार (THOUGHT OF RAJA RAM MOHAN ROY, RAM MANOHAR LOHIA, MANVENDRA NATH ROY, JAIPRSKASH NARAYAN)
इकाई–4	जवाहर लाल नेहरू, दीनदयाल उपाध्याय एवं मौलाना अबुल कलाम आजाद के विचार (THOUGHT OF JAWAR LAL NEHRU, DINDYAL UPADHYAY, MOULANA ABUL KALAM AZAD.)

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एम.ए. (राजनीति विज्ञान–प्रथम सेमेस्टर)
M.A. (Political Science-First Semester)

द्वितीय प्रश्नपत्र

भारतीय शासन एवं राजनीति

(Indian Government and Politics)

इकाई–1	भारतीय संविधान की पृष्ठभूमि, संगठन, कार्यप्रणाली वैचारिक आधार, स्त्रोत प्रस्तावना, भारतीय संविधान की विशेषताएँ (BACKGROUND OF INDIAN CONSTITUTION, ORGANIZATION IDEOLOGICAL BASIS SOURCE, PREAMBLE, FEATURES OF INDIAN CONSTITUTION)
इकाई–2	मौलिक अधिकार, कर्त्तव्य, नीति निर्देशक सिद्धांत, संविधान संशोधन प्रक्रिया, केन्द्र –राज्य सम्बन्ध, जम्मू कश्मीर एवं धारा 370 तथा 35–A] छठवीं अनुसूची (FUNDAMENTAL RIGHTS AND DUETIES, DIRECTIVE PRINCIPLES, STATE POLLEY, CONSTITUTION AMENDMENT PROCESS, CENTRE- STATE RELATION, JAMMUKASHMIR AND ARTICLE 370 AND 35 A, 6th SCHEDULE OF THE CONSTITUTION.)
इकाई–3	**संघीय व्यवस्थापिका** – लोक सभा, राज्य सभा, **संघीय कार्यपालिक** – राष्ट्रपति, प्रधानमंत्री एवं मंत्री परिषद। (UNION LEGISLATURE – LOK SABHA, RAJYA SABHA, UNION EXECUTIVE PRESIDENT, PRIME MINISTER AND COUNCIL OF MINISTERS)
इकाई–4	**संघीय न्यायपालिका –** सर्वोच्च न्यायलय एवं न्यायिक पुनरावलोकन। **भारतीय राजनीति** – जातिवाद, क्षेत्रवाद, धर्म एवं सम्प्रदायवाद, राजनीति का अपराधीकरण एवं भ्रष्टाचार (UNION JUDICIARY- SUPREME COURT AND JUDICICAL REVIEW. INDIAN POLITICS-CASTISM, REGIONALISM, RELIGION AND COMMUNALISM, CRIMINALISTION OF POLITICS AND CORRUPTION.

एम.ए. (राजनीति विज्ञान–प्रथम सेमेस्टर)
M.A. (Political Science-First Semester)

तृतीय प्रश्न पत्र

तुलनात्मक राजनीति

(Comparative Politics)

ईकाइ–1	तुलनात्मक राजनीति अर्थ, प्रकृति क्षेत्र एव ंसमस्याएं। राजनीतिक व्यवस्था का अर्थ, विशेषताएॅ एवं महत्व। (Comparative Politics Meaning, Nature, Scope and Problems, Political System Concept, Features and Importance.)
ईकाइ–2	राजनीति व्यवस्था के अध्ययन के उपागम–डेविड ईस्टन का आगत निर्गत सिद्धांत, आमण्ड एव ंपावेल का संरचनात्मक प्रकार्यात्मक सिद्धांत, संविधान एवं संविधानवाद (Approaches to the Study of Political System, Input-Output Theory of David Easton, Amond and Powell's Structural Functional Theory, Constitution and constitutionalism.)
ईकाइ–3	परम्परागत एवं आधुनिक राजनीतिक अध्ययन की विशेषताए, व्यवहारवाद एवं उत्तर व्यवहारवाद, राजनीतिक सिद्धांत– अवधारणा, राजनीतिक सिद्धांत का पतन एवं पुनर्जीवन। (Characteristics of Traditional and Modern Political Studies Behaviouralism and Post Behaviouralism. Political Theory- Concept Decline of Political Theory and restablishment of Political Theory)
ईकाइ–4	राजनीतिक संस्कृति, राजनीतिक समाजीकरण, राजनीतिक संचार, (Political culture, Political Socialisation, Political Communication)

एम.ए. (राजनीति विज्ञान–प्रथम सेमेस्टर)
M.A. (Political Science-First Semester)

चतुर्थ प्रश्न पत्र

अंतर्राष्ट्रीय संगठन

(International Organization)

ईकाइ–1	अंतर्राष्ट्रीय संगठन की प्रकृति एव ंविकास अंतर्राष्ट्रीय संगठन राष्ट्र–राज्य, अंतर्राष्ट्रीय व्यवस्था, राज्यों के बीच समन्वय । (Nuture and Evolution of International Organization Coordination among Nations , Nation State, and International System)
ईकाइ–2	राष्ट्र संघ–निर्माण, संरचना, कार्य, सफलता एवं असफलता एवं मूल्यांकन (League of Nation-Formation, Function, Achievements, Merits and Demerit and evaluation.)
ईकाइ–3	संयुक्त राष्ट्र संघ निर्माण, संरचना, विवादों के समाधान के शान्तिपूर्ण एवं बाध्यकारी उपाय, आर्थिक एवं सामाजिक विकास में संयुक्त राष्ट्र संघ की भूमिका। (United Nation-Formation Structure, Peace and Coercive Measures to Settle the Disputes in United Nations The role of UN to Social and Economic Development)
ईकाइ–4	क्षेत्रीय संगठन–सार्क, आसियान, युरोपियन यूनियन, ब्रिक्स (RegionalOrganization-SAARC, ASEAN, EUROPEAN UNION, BRICS)

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एम.ए. (राजनीति विज्ञान–द्वितीय सेमेस्टर)
M.A. (Political Science-Secound Semester)

प्रथम प्रश्न पत्र

पाश्चात्य राजनीतिक चिंतन
(Western Political Thought)

ईकाइ–1	प्लेटो, अरस्तु, मैकियावेली (Plato, Aristotle, Machiavelli)
ईकाइ–2	जीन बोंदा, थामस हॉब्स, जान लॉक, जीन जैक्स रूसो, (Jean Bodin, Thomas Hobbes, John Luck, Jaen Jacous rousseau)
ईकाइ–3	बैथम, जे. एस. मिल, टी.एच. ग्रीन (Bentham, J.S. Mill ,T.H. Green)
ईकाइ–4	हिगेल, मार्क्स, लेनिन, माओ, (Hegel, Marx, Lenin, Mao)

एम.ए. (राजनीति विज्ञान–द्वितीय सेमेस्टर)
M.A. (Political Science-Secound Semester)

द्वितीय प्रश्न पत्र

भारत में राज्यों की राजनीति
(State Politics in India)

ईकाइ–1	राज्य की कार्यपालिकाः राज्यपाल, मुख्यमंत्री एवं मंत्री परिषद। (State Executive: GOVERNOR, CHIFE MINISTER and Council of Ministers)
ईकाइ–2	राज्य की व्यवस्थापिकाः विधानसभा एव ंविधान परिषद। राज्य की न्यायपालिकाः उच्च न्यायालय एवं अधिनस्थ न्यायालय। (State Legislature: Vidhan Sabha and Vidhan Parishad State Judiciary: High Court and Subordinate Courts)
ईकाइ–3	राज्य स्वायत्ता की मांग, नये राज्यों के गठन कर मांग, अंर्तराज्यीय नदी जल विवाद, भारत में राज्य राजनीति को प्रभावित करने वाले कारक। (Demand for State Autonomy, Demand For the Creation of New State, Inter State Disputes, Factors influencing State Politics in India)
ईकाइ–4	राज्य योजना आयोग, राज्य वित आयोग, राज्य निर्वाचन आयोग राज्य राजनीति की प्रमुख प्रवृत्तियॉ। (State Planning commission, State Finance Commission State Election Commission, Trends in State Politics of India.)

एम.ए. (राजनीति विज्ञान–द्वितीय सेमेस्टर)
M.A. (Political Science-Secound Semester)

तृतीय प्रश्न पत्र

विकासशील देशों की तुलनात्मक राजनीति
(Comparative Politics of Developing Countries)

इकाई–1	सरकारों का वर्गीकरण– एकात्मक–संघात्मक, संसदीय – अध्यक्षात्मक सरकार, संघवाद। Classification of Government- Unitary, Federal, Parliamentary, Presidential, Federalism)
ईकाइ–2	राजनीतिक संस्थाएं– व्यवस्थापिका, कार्यपालिका एवं न्यायपालिका, शक्ति पृथक्करण सिद्धांत। Political Institutions- Legislature, Executive and Judiciary, Theory of Seperation pf Powers)
ईकाइ–3	राजनीतिक दल एवं दबाव समूह, नौकरशाही संरचना कार्य एवं भूमिका। (Political Parties and Pressure Groups Bureaucracy- Structure Function and Role)
ईकाइ–4	राजनीतिक विकास, राजनीति अभिजन, राजनीतिक समाजीकरण, राजनीतिक आधुनिकीकरण। (Political Development, Political Elites, Political Socialisation, political Modernization.)

एम.ए. (राजनीति विज्ञान–द्वितीय सेमेस्टर)

M.A. (Political Science-Secound Semester)

चतुर्थ प्रश्न पत्र

भारत की विदेश नीति

(Indian Foreign Policy)

ईकाइ–1	विदेश नीतिः अर्थ, प्रकृति एवं निर्धारण तत्व भारतीय विदेशनीति के निर्धारण तत्व आन्तरिक एवं बाह्यय भारतीय विदेशनीति के सिद्धांत एवं उद्देश्य। Foreign Policy: Meaning, Nature and Determinants Determinants of Indian Foreign Policy: Internal and External Principles and Objectives of Indian Foreign Policy
ईकाइ–2	भारत और अमेरिका, भारत एवं रूस। (India and the USA, India and Russia)
ईकाइ–3	भारत एवं पाकिस्तान, भारत एव ंचीन, भारत एवं श्रीलंका। (India and Pakistan, India and China, India and Srilanka)
ईकाइ–4	भारत एवं संयुक्त राष्ट्र संघ भारत एव ंआण्विक निःशस्त्रीकरण India and the U.N.O India and Nuclear Disarmament

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एम.ए. (राजनीति विज्ञान–तृतीय सेमेस्टर)
M.A. (Political Science-Third Semester)
प्रथम प्रश्न पत्र

अंतर्राष्ट्रीय राजनीति के सिद्धांत
(Principles of International Politiecs)

ईकाई–1	अंतर्राष्ट्रीय राजनीतिका विषय के रूप में विकास, प्रकृति एवं क्षेत्र। अध्ययन पद्धति–परम्परागत एवं वैज्ञानिक। (Evolution of International Politics as discipline, Nature, Scope, Method of Study-Traditional and Scientific.)
ईकाई–2	अंतर्राष्ट्रीय राजनीति के सिद्धांत – यथार्थवाद, आदर्शवाद, साम्यावस्था, निर्णय–निर्माण, खेल, संचार एवं व्यवस्था सिद्धांत (Theories of International Politics, Realism Idealism, Equilibrium, Decision making, Game, communication & System Theory.)
ईकाई–3	शक्ति की अवधारणा राष्ट्रीय शक्ति के तत्व एवं सीमाएं । शक्तिसंतुलन । सामूहिक सुरक्षा–नव साम्राज्यवाद राष्ट्रहित और अंतर्राष्ट्रीय विचारधारा एवं नैतिकता। (Concept of Power-Elements and limitations of National Power-Balance of Power-Collective Security, New colonialism. National Interest and International Ideology and Morale.)
ईकाई–4	निःशस्त्रीकरण, परमाणु अप्रसार–सी टी बी टी, एन पी टी, क्षेत्रीय संगठन–सार्क, एसिआन, ओपेक। (Disarmament, Nuclear Non Proliferation-CTBT NPT. Regional Organization-SAARC, ASEAN, OPEC.)

एम.ए. (राजनीति विज्ञान–तृतीय सेमेस्टर)
M.A. (Political Science-Third Semester)
द्वितीय प्रश्नपत्र

लोक प्रशासन भाग–I

(Public Administratration) Part-I

इकाई–1	लोकप्रशासनः परिभाषा, प्रकृति, क्षेत्र, निजी प्रशासन से अंतर अध्ययन के उपागम–व्यावहारिकवादी, तुलनात्मक, निर्णय परक, विकास–प्रशासन, नवीन लोकप्रशासन (Public Administration-Definition, Nature, Scope, Difference between Private Administration; Approaches to Study- Behaviouralism, Comparative, Decision Making, Development Administration, New Public Administration.)
ईकाइ–2	संगठन के सिद्धांतः नियंत्रण का क्षेत्र, आदेश की एकता, पदसोपान, प्रत्यायोजन, समन्वय। (Theory of Organization:-Hierarchy,Unity of Command Span of Control, Delegation of Power, Coordination.)
ईकाइ–3	केन्द्रीयकरण, विकेन्द्रीकरण, मुख्य कार्यपालिका–प्रकार एवं भूमिका, सूत्र एवं स्टाफ अभिकरण, विभागीय संगठन, स्वतंत्र नियामिकीय आयोग (Centralisation and Decentralisation, Chief Executive- Types and Role. Line and Staff Agencies, Departmental Organization, Independent Regulatory Commission.)
ईकाइ–4	लोक निगम भर्ती, पदोन्नति, प्रशिक्षण, सेवानिवृत्ति, संघ लोक सेवा आयोग, नौकरशाही। (Public Corporation, Recruitment, Promotion and Training, Retirement, Union Public Service Commission, Bureaucracy.)

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M.A. (Political Science-Third Semester)
तृतीय प्रश्न पत्र

शोध प्रविधि भाग–I

(Research Methodology Part I)

इकाई–1	सामाजिक शोध की प्रकृति, महत्व एवं उपयोग शुद्ध एवं व्यवहारिक शोध समस्या की पहचान, शोध अभिकल्प, उपकल्पना का निर्माण एवं परीक्षण। (Nature of Social Research, Importance and uses, Deference between Pure and Applied Research, Identification of Research Problem Research Design, Hypotheses Formulation and testing.)
ईकाई–2	सामाजिक सर्वेक्षण–उद्देश्य, महत्व, प्रक्रिया, तथ्य संकलन की तकनीकि, तथ्यों के प्राथमिक एवं द्वितीय स्त्रोत। (Social Survey- Amis, Importance, process, Data Collection, Primary and Secondary Source of Facts.)
ईकाई–3	अवलोकन पद्धति, साक्षातकार पद्धति, प्रश्नावली एवं अनुसूची। (Observational Method, Interview Method, Questionaire and Schedules.)
ईकाई–4	अध्ययन के विभिन्न प्रकार–पेनल स्टडी, केस स्टडी क्षेत्रीय अध्ययन। (Types of Study- Panel , Case and Field Study)

एम.ए. (राजनीति विज्ञान–तृतीय सेमेस्टर)
M.A. (Political Science-Third Semester)
चतुर्थ प्रश्नपत्र
छत्तीसगढ़ का शासन एवं राजनीति
(Government And Politics of Chhattisgarh)

इकाई–1	**छत्तीसगढ़ में राष्ट्रीय आंदोलन– 1855 से 1947 –** असहयोग आंदोलन, सविनय अवज्ञा आन्दोलन और भारत छोड़ो आन्दोलन। **National Movement in Chhattisharh from, 1885 to 1947-** Nonco- Opration Movement, Civil Disobidience Movement and Quit India Movement.
ईकाइ–2	प्रमुख महापुरूष – गुरूघासीदास, पं. सुंदरलाल शर्मा, ठाकुर प्यारेलाल सिंह, डॉ. खूबचंद बघेल का योगदान **Major Social Reformist and Political Leaders-** Guru Ghasidas, Pt. Sunder Lal Sharma, Thakur Pyare Lal Singh, Dr. Khubhchand Baghel and Their Contribution.)
ईकाइ–3	छत्तीसगढ़ राज्य निर्माण हेतु आंन्दोलन एवं राज्य निर्माण **छ.ग. में स्थानीय स्वशासन** – ग्राम पंचायत, नगर पंचायत एवं नगर निगम का संगठन, कार्य अधिकार एवं स्थिति। **छ.ग. में जनजातीय क्षेत्रों का प्रशासन–** संवैधानिक प्रावधान, पांचवी अनुसूची के अंतर्गत प्रशासित क्षेत्र, बस्तर एवं सरगुजा विकास प्राधिकरण Formation of Chhattisgarh State and Political Movement For it. **Local Self Govt. In Chhattisgarh-** Gram Panchayat, Nagar Panchayat, Nagar Nigam – Organisation Function and Status. **Tribal Area Administration in Chhatisgarh** - Constitutional Provision, area Under 5th Schedul in C.G., Sarguja And Baster Vikas Pradhikaran.
ईकाइ–4	छत्तीसगढ़ की राजनीति के प्रमुख निर्धारक तत्व एवं विशेषताएं। छ.ग. में जिला प्रशासन एवं जिलाधीश की भूमिका **छ.ग. में विकास प्रशासन –** जिला पंचायत CEO, कार्य, अधिकार एवं भूमिका। शासन की प्रमुख विकास योजनाएं। (Main Determinating Factors and Features of State Politics in Chhattisgarh. Role Of Collector In Distict Administration. Role of Zila Panchayat CEO in Development Administration, Main Devlopment Plans For State.)

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एम.ए. (राजनीति विज्ञान–चतुर्थ सेमेस्टर)

M.A. (Political Science-Fourth Semester)

प्रथम प्रश्न पत्र

अंतर्राष्ट्रीय राजनीति के समाकालीतन मुद्दे

(CONTEMORAARY OF INTERNATIONAL OLITICS)

इकाई–1	अंतराष्ट्रीय राजनीति में असंलग्नता–आधार, भूमिका, महत्व एवं प्रासंगिकता। (Non-Alignment in International Politics Basis, Role, Importance and Relevance.)
ईकाइ–2	शीतयुद्ध एवं शीतयुद्ध की समाप्ति– कारण एवं परिणाम । नई विश्व व्यवस्था (Cold War and End of Cold War- Cause and results. New World Order.)
ईकाइ–3	उत्तर शीतयुद्ध कालीन महत्वपुर्ण मुद्दे– वैश्वीकरण, मानवाधिकार, पर्यावरण, आंतकवाद (Important issues in post cold war era- Globalisation Human Rights, Environment, Terrorism.)
ईकाइ–4	प्रमुख राष्ट्रों की विदेश नीतियां–भारत, संयुक्त राज्य अमेरिका, चीन, रूस (Foreign Policy of Important Contries India, USA, China and Russia.)

एम.ए. (राजनीति विज्ञान–चतुर्थ सेमेस्टर)

M.A. (Political Science-Fourth Semester)

द्वितीय प्रश्न पत्र

लोक प्रशासन भाग–II

(Public Administratration) Part-II)

इकाई–1	कार्मिक समस्या निवारण व्यवस्था (भारतीय प्रशासन के विशेष संदर्भ में)। Personnel Administration- System to Solve the Problem of Personnel (In reference to Indian Administration.)
ईकाइ–2	वित्तीय प्रशासनः अर्थ, प्रकृति, विशेषएं। बजट–सिद्धांत एवं महत्व, भारत में बजट निमार्ण प्रक्रिया, कार्यपालिका एवं न्यायपालिका का प्रशासन पर नियंत्रण। (Finance Administration, Nature, Characteristics, Budget- Theory and Importance; Budget making process in India; Control over administration by Executive and judiciary.
ईकाइ–3	प्रशासनिक व्यवहार–नेतृत्व, निर्णय, संचार जवाबदेहिता। (Administration Behaviour, Leadership, Decision making, Communication and Accountabiltity.)
ईकाइ–4	लोक प्रशासन में भ्रष्टाचार आम्बुड्समैन, लोकपाल, लोकायुक्त। प्रशासन में स्थानीय स्वायतशासीत संस्थाओं की भूमिका। (Corruption in Administration, Ombudsman, Lokpal, Lokayukt,. Role of Local Autonomous Institutions in Administritation)

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M.A. (Political Science-Fourth Semester)

तृतीय प्रश्न पत्र

शोध प्रविधि भाग–II

(Research Methodology Part II)

इकाई–1	निदर्शन, अनुमापन प्रविधियॉ, प्रक्षेपी प्रविधियॉ (Sampling, Scaling Techniques, Projections Techniques.)
ईकाइ–2	अनुसंधान दल, अनुसंधान की संमस्या, तथ्यों का वर्गीकरण एवं सारणीयन (Research Team, Problems of Research, Classification of Facts and Tabulation.)
ईकाइ–3	तथ्यों का विश्लेया एवं व्याख्या । प्रतिवेदन लेखन तथ्यों को चित्रमय प्रदर्शन। (Analysis and Interpretation of Facts. Report writing Reprograpic Presentation of Data.)
ईकाइ–4	सामाजिक अनुसंधान में संख्यिकी का प्रयोग एवं सीमाएं । मीन, मोड, मीडीयम कम्प्युटर का उपयोग। (The use and limitation of Statistics. Mean Mode, Medium, and Use of computer.)

एम.ए. (राजनीति विज्ञान–चतुर्थ सेमेस्टर)
M.A. (Political Science-Fourth Semester)

चतुर्थ प्रश्नपत्र

राजनीतिक विचारधाराएं एवं आधुनिक राजनीतिक चिन्तन
(Political Ideologiese and Modern Political Thought)

इकाई–1	**व्यक्तिवाद उदारवाद** – मूल सिद्धांत – गुणदोष **समकालीन उदारवाद** – प्रमुख विचारक– **जान राल्स** – न्याय की अवधारणा। **सी.बी. मैक्फर्सन** – लोकतंत्र का सिद्धांत , स्वत्वमूलक, व्यक्तिवाद। **Individualism and Liberalism** – Conecpt, Main Theories Merits and Demerits. Contemporary Liberalism, Main Thinkesrs. **John Rawls** – Concept of Justice **C.B. Mcpherson** – Democracy, Possessive Individulism
ईकाइ–2	**अस्तित्ववाद** – अवधारणा, ज्यां पाल सार्त्र का योगदान **फांसीवाद** – अवधारणा – प्रमुख विशेंषताएं। **कार्ल पॉपर** – खुले समाज का विश्लेषण, इतिहासवाद का खण्डन। **Existentialism** – Concept, Jean Paul Sartre. **Fascim** – Concept, Main Features. **Karl Popper** – Description of open society, Critism of Historism
ईकाइ–3	**सर्वाधिकारवाद** – अवधारणा, प्रमुख विशेषताएं। **समकालीन स्वतंत्रता** – आइजा कर्लिन एवं मिल्टन फ्रीडमैन। **लियों स्ट्रास** – समकालीन लोकतंत्र की आलोचना, शास्त्रीय – राजनीतिक सिद्धांत का समर्थन। **नारीवाद** – अवधारणा, विशेषताएं। Totalitarianism – Concept – Main Features. Contemporary Liberty – Isaihberin And Milton Friedman. Leo Straus – Criticism of Democracy, Defence of Classical Political Theory. Faminism – Conecpt, Features.
ईकाइ–4	**समकालीन मार्क्सवाद** – एण्टोनियो ग्राम्शी – प्रभुत्व की अवधारणा, बुद्धिजीवियों की भूमिका। **फ्रैंकफर्ट स्कुल** – परिचय, सभी प्रकार के प्रभुत्व का विरोध। **समाजवाद** – अवधारणा, विशेषताएं। **बहुसंस्कृतिवाद** – अवधारणा, विशेषताएं। **Contemporary Marxism** – Antonio Gramci- Concept of Hegemony, Role of Intelectuals. **Frankfurt School** – Introduction, Criticism of All Kinds of Hegemony. **Socialism** – Concept, Features. **Multiculturalism** - Conecpt and Features.

HEMCHAND YADAV VISHWAVIDYALAYA,

DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A. (Sociology) Semester Exam

UNDER

FACULTY OF ART'S

Session 2019-20

(Approved by Board of Studies)
Effective from June 2019

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

COURSE OF STUDIES FOR M.A. EXAMINATION IN SOCIOLOGY, UNDER SEMESTER SYSTEM IN AFFILETED COLLEGES OF DURG VISHWAVIDYALAYA, DURG (C.G.)

EFFECTIVE FROM THE ACADEMIC SESSION (2019-20)

M.A. Examination in Sociology shall be conducted in four semesters, each having 500 hundred marks, totalling to 2000 marks.

The detailed Course Structure Semester wise is mentioned below.

Sl. No.	Paper No.	Title	Marks		
A. FIRST SEMESTER:					
Sr. No.	Paper	Subject	I	T	Total
1	Paper-I/CC1	Classical Sociological Tradition	20	80	100
2	Paper-II/CC2	Philosophical and Conceptual Foundation of Research Methodology	20	80	100
3	Paper-III/CC3	Social Change in India	20	80	100
4	Paper-IV/CC4	Rural Sociology	20	80	100
5	Paper-V/P 1	Practical-I			100
B. SECOND SEMESTER					
6.	Paper-VI/CC5	Classical Sociological Thinkers	20	80	100
7.	Paper-VII/CC6	Quantitative Research Techniques in Sociology	20	80	100
8.	Paper-VIII/CC7	Sociology of Development	20	80	100
9.	Paper-IX/CC8	Indian Rural Society	20	80	100
10.	Paper-X/P2	Practical-II			100

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C. THIRD SEMESTER					
11.	Paper-XI/CC9	Classical Sociological Theories	20	80	100
12.	Paper-XII/CC10	Social Movements in India	20	80	100
13.	Paper-XIII/CC11	Perspectives of Study to Indian Society	20	80	100
14.	Paper-XIV/CC12	Industry and Society in India	20	80	100
15	Paper-XV/CC13	Criminology	20	80	100

D. FOURTH SEMESTER					
16	Paper-XVI/CC14	Modern Sociological Theories	20	80	100
17	Paper-XVII/CC15	Comparative Sociology	20	80	100
18	Paper-XVIII/CC16	Contemporary Issues in Industry	20	80	100
19	Paper-XIX/CC17	Criminology: Correctional administration	20	80	100
20	Paper-XX/P3	Project Report	-	-	100

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

FIRST SEMESTER

Paper No. I/CC1 **Marks-80**

CLASSICAL SOCIOLOGICAL TRADITION

Unit-I: Historical Background of the Emergence of Sociology

a. Traditional Feudal Economy and Social Structure
b. Impact of Industrial Revolution and New Mode of Production on Society and Economy.
c. Emergence of Capitalist Mode of Production- Nature and Feature of Capitalism
d. Enlightenment and Its Impact on Thinking and Reasoning

Unit-II: Auguste Comte

a. Social Statics and Dynamics
b. Law of Three Stages
c. Hierarchy of Sciences
d. Positivism

Unit-III: Emile Durkheim

a. Social Facts
b. Mechanical and Organic Solidarity
c. Division of Labour
d. Theory of Suicide

Unit-IV: Vilfredo Pareto

a. Logical and Non- Logical Action
b. Residues and Derivations
c. Theory of Social Change
d. Contributions to Methodology

Unit-V: Herbert Spencer

a. Social Orgainc
b. Evolution
c. Synthetic Philosophy
d. Struggle for existence

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References:

1. Abraham, F and Morgan, J.H. 1985 — Sociological Thought from Comte to Sorokin Macmillan, New Delhi.
2. Adams, B.N. and Sydie, R.A. 2002 — Sociological Theory Vistaar Publications, New Delhi
3. Aron, R. 1965 — Main Currents in Sociological Thought Vol. I and Vol.II Penguin, New Delhi.
4. Coser, L.A. 2001 — Masters of Sociological Thought Rawat Publishers, Jaipur
5. Rex, John 1973 — Discovering Sociology Routledge and Kegan Paul, London
6. Turner, J.H. 2001 — The Structure of Sociological Theory Rawat Publishers, Jaipur.
7. Zeitlin, I.M. 1981 — Ideology and the Development of Sociological Theory, Prentice Hall, London.
8. _____ 1998 — Rethinking Sociology: A Critique of Contemporary Theory. Rawat Publishers, Jaipur.

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Paper-II /CC2 **Marks-80**

PHILOSOPHICAL AND CONCEPTUAL FOUNDATION OF RESEARCH METHODOLOGY

Unit-I: Philosophical Roots of Social Research

a. Issues in the Theory of Epistemology: Forms and Types of knowledge,
b. Validation of knowledge
c. Positivism and Its Critique: Contributions of Comte, Durkheim and Popper.
d. Methodological perspectives in Sociology.

Unit-II: Social Research

a. Meaning & Importance Social Research
b. Objective of Social Research
c. Stapes of Social Research
d. Problems of Social Research

Unit-III: Nature of Social Reality and Approaches to It

a. Research Design: Steps and Processes of Its Formulation
b. Type of Research Design: Exploratory, Descriptive, Explanatory, Diagnostic and Experimental
c. Role of concepts and Hypotheses
d. Problems of Objectivity

Unit-IV: Qualitative Methods in Social Research

a. Techniques and methods of Qualitative Research: Observation and Interview Guide
b. Case study, Content Analysis
c. Participatory Rural Appraisal (PRA)
d. Encounters and Experiences in Field work

Unit-V: Issues in Social Research

a. Inter disciplinary Research
b. Issues in Qualitative Research
c. Theoretical Vs. Applied Research
d. Processing of Data: Classification, Tabulation and Interpretation.

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Paper No. III/CC3 **Marks-80**

SOCIAL CHANGE IN INDIA

Unit-I: Conceptual and Theoretical Frame work

a. Concept
b. Forms
c. Linear Theory
d. Cyclic Theory

Unit-II: Factors of Social change

a. Economic
b. Socio- Psychological
c. Cultural and Religious
d. Technology

Unit-III: Trends and Processes of Change in Modern India

a. Sanskritization
b. Secularization
c. Modernijation
d. Globalization

Unit- IV: Changes in Tribal and Rural India

a. Changes in Tribal and Rural Economy
b. Changes in Socio-cultural spheres
c. Land Alienation
d. Welfare Measures and Consequent Changes

Unit-V:- Changes in Urban and Industrial India

a. In Migration and Growth of informal sector.
b. development of Slums.
c. Development of Criminal Activities.
d. Welfare measures and Consequent Changes.

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Paper No. IV/CC 4 **Marks-80**

RURAL SOCIOLOGY

Unit-I: Characteristics and Approaches

a. Concept and Characteristics of Peasant Society
b. Concept and Characteristics of Agrarian Society
c. Caste and Jamani Approach
d. Sub- Altern Approach

Unit-II: Agrarian Institutions

a. Land Ownership and Its Types: After Independence
b. Agrarian Relations and Modes of Production
c. Agrarian Social Structure
d. Agrarian movement

Unit- III: Planned Change

a. Rural leadership
b. Factionalism
c. Panchayati Raj before and after 73rd Amendment
d. Five Year's Plans in India

Unit-IV: Rural Development and Change

a. Green Revolution
b. Land Reform
c. Globalization and its Impact on Agriculture
d. Community Development Programme

Unit-V: Welfare measures and consequent Changes

a. Self-help Group(SHG)
b. MNREGA
c. SSA
d. Swachh Bharat Abhiyan

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Paper No. V/P1 **Marks-100**

PRACTICAL-I

Practical based on Field Work & Preparation of tools
Interview Guide and case study

Scheme of Evaluation- 50% by Internal Examiner and rest 50% by Viva-Voce Examination evaluated both by the Internal and External Examiner.

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SECOND SEMESTER

Paper No. –VI/CC 5 **Marks-80**

CLASSICAL SOCIOLOGICAL THINKERS

Unit-I: Karl Marx

a. Materialistic Interpretation of History
b. Class and Class Struggle
c. Alienation
d. Surpls Value

Unit-II: Thurstein Veblen

a. Theory of Leisure class
b. Concepts of Social Change
c. Comparison of Marx and Veblen's theories
d. Contribution of Veblen's

Unit-III: Max Weber

a. Theory of Social Action
b. Concepts of Status, Class and power
c. Sociology of Religion and Economic Development
d. Authority

Unit-IV Talcott Parsons

a. Social Action
b. Pattern variables
c. Social System
d. Means of Social Control

Unit-V: Robert K. Merton

a. Reference Group
b. Social Conformity and Anomie
c. Basic postulate in Functional analysis
d. Paradigm of Functional analysis

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Paper No.-VII/CC6 **Marks-80**

QUANTITATIVE RESEARCH TECHNIQUES IN SOCIOLOGY

Unit-I: Sampling

a. Concept of Importance Sampling
b. Types of Sampling
c. Sampling error
d. Survey Vs. Sampling based study in sociology

Unit-II: Quantitative method and survey Research

a. Techniques of Survey Research: Interview
b. Tools of Research; Preparation of Questionnaire and Interview Schedule
c. Processing of Data: Classification, Tabulation and Interpretation
d. Use of Computer in Data Processing

Unit-III: Measurement and Scaling Techniques

a. Levels of Measurements: Types of Scales- Nominal and Ordinal
b. Reliability and Validity of Scaling
c. Measures of Social Distance: Thurston, Lickert and Bogardus Scale
d. Sociometry

Unit-IV: Statistics in Social Research

a. Importance and limitation of Statistics
b . Measures of Central Tendency: Mean, Median and Mode
c. Measures of Dispersion- Standard Deviation
d. Correlation Analysis- Chi Square

Unit-V: Qualitative and Quantitative research method

a. Social Research, Action research and Participatory research
b. Application of computers in Social research; MS office.
c. Ethical issues in social research.
d. Research Report

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Paper No. –VIII/CC7 **Marks-80**

SOCIOLOGY OF DEVELOPMENT

Unit-I: Perspectives on Development

a. Modernization
b. Marxist
c. Dependency
d. Alternative

Unit-II: Changing Conception of Human Development

a. Mainstream vs. Indigenous Model of Development
b. Human Indicator Index
c. Sustainable Development: Socio- Cultural
d. Impact of Bio-Technology and Information Technology on Development.

Unit-III: Indian Experience on Development

a. Sociological Appraisal of Five Year Plans
b. Social Consequences of Economic Reforms
c. Socio Cultural Impact of Globalization
d. Social Implication of InfoTech and Bio-Tech Revolution

Unit-IV: Consequences of Development

a. Development and Displacement
b. Development and Socio- Economic Disparities
c. Ecological Degradation
d. Development and Migration.

Unit-V: Issues and development in Contemporary India.

a. Social Exclution
b. Gender Discrimination
c. Privatization and unfavourable Service condition.
d. Sustainability.

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Paper No. IX /CC8 **Marks-80**

INDIAN RURAL SOCIETY

Unit-I: Tribal Society as Agrarian Society

a. Tribe Concept and Characteristic
b. Tribe classification
c. Changing problems of Tribal Land
d. Problem of Tribal Society

Unit-II: Social Issues

a. Migration
b. Land Alienation
c. Loss of Livelihood
d. poverty

Unit-III: Contemporary Issues

a. Health
b. Education
c. Changing status of Rural Women
d. Inequality

Unit-IV: Peasant Movement

a. Causes
b. Types
c. Tebhaga
d. Telengana

Unit-V: Naxlite movement in Contemporary India.

a. Origin and affected area
b. Causes
c. Present status; Governments measures and people's response.
d. Changing of Nexlite Movement

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Paper No. X/P2 PRACTICAL-II

Marks-100

Practical based on Field Work & Preparation of tools Questionnaire, Interview Schedule Preparation and Tabulation.

Scheme of Evaluation- 50% by Internal Examiner and rest 50% by Viva-Voce Examination evaluated both by the Internal and External Examiner.

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THIRD SEMESTER

Paper No. XI /CC9 **Marks-100**

CLASSICAL SOCIOLOGICAL THEORIES

Unit-I: Positivism

a. Origin and Basic Postulates
b. Contributions of Comte
c. Contributions of Durkheim
d. Criticism

Unit-II: Functionalism

a. Origin and Basic Postulates
b. Contributions of Parsons
c. Contribution of Merton
d. Criticism

Unit-III: Conflict theory

a. Contribution of L.A Coser
b. Contributions of Karl Marx
c. Contribution of Dahrendorf
d. Criticism

Unit-IV: Structuralism

a. Origin and Basic Postulates
b. Contribution of Red Cliff Brown
c. Contribution of Levistrauss
d. Criticism

Unit-V:Exchange Theory

a. Origin and Basic postulates
b. Contribution of peter Blau
c. Contribution of George Homans.
d. Criticism

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Paper No.XII/CC10 **Marks-100**

SOCIAL MOVEMENTS IN INDIA

Unit-I: Nature and Types

a. Characteristics
b. Types
c. Reasons
d. Power Structure and Social Movements

Unit –II: Basis of Social Movement

a. Class, Caste, Ethnicity and Gender
b. Types of leadership and relationship between leaders and masses
c. Political institution and social movement.
d. Role of media in social movement.

Unit-III: Theoretical Perspectives

a. Marxian and Post-Marxian
b. Weberian Perspectives
c,. Structural-Functional
d. Postmodernist

Unit-IV: Traditional Social Movements

a. Labour and Trade Union
b. Tribal
c. Peasant
d. Nationalist

Unit-V: New Social Movements

a. Dalit
b. Women
c. Ethnic
d. Environmental

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Paper No.XIII/CC11 **Marks-100**

PERSPECTIVES OF STUDY TO INDIAN SOCIETY

Unit-I: Indological / Textual

a. Approach of Study
b. G.S. Ghurye
c. Louis Dumont
d. Criticism

Unit-II: Structural Functionlism

a. Approach of Study
b. M.N. Srinivas
c. S.C. Dube
d. Criticism

Unit-III: Marxism

a. Approach of Study
b. D.P.Mukharjee
c. A.R. Desai
d. Criticism

Unit-IV: Subaltern Perspective

a. Approach of Study
b. B.R. Ambedkar
c. David Hardiman
d. Criticism

Unit-V: Civilization

a. Approach of study
b. N.K. Bose
c. Surjeet Sinha
d. Criticism

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Paper No. XIV/CC12 **Marks-100**

INDUSTRY AND SOCIETY IN INDIA

Unit-I: Industrial Sociology and Classical Sociological Tradition

a. Classical Scientific Management
b. Division of Labour
c. Bureaucracy and Rationality
d. Production Relations and Alienation

Unit-II: Industrial Organizations

a. Formal and Informal Organizations, Structure and Function
b. Line and Staff Organization
c. Contemporary Organization Realities
d. Personal Mangment

Unit-III: Problems through Industrialization process

a. Family
b. Stratification
c. Habitat and Settlement
d. Environmental

Unit-IV: Subjective Experience of Work

a. Work Ethics, Work Value, Work Attitude and Work Process
b. Motivation to Work,
c. Work Satisfaction, Incentives and Its Effects
d. Human Relation at work

Unit-V: Technological Change and Automation

a. Technology and Social Structure in Industry
b. Organizational Choice and Technological Change
c. Resistance to Automation and Change
d. Impact of Automation

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Paper No.XV/CC13

CRIMINOLOGY

Marks-100

Unit-I: Conceptual and Theoretical Approaches

a. Concept of crime Legal and Sociological,
b. Crime Causes, Types of Crime
c. Theories on Crime Classical and Positism
d. Sociological and Geographical

Unit-II: Type of Criminals and Crime

a. Juvenile delinquency
b. Women and Crime
c. White collar crime
d. Organised Crime

Unit-III: Changing Profile of Crime and Criminals;

a. Corruption: Types, Causes, and Consequences.
b Cyber Crime: Causes, Prevention and Control
c Crime Against Women: Causes, Prevention and Control
d Crime Against Child labour: Causes, Prevention and Control

Unit-IV: Theories of Punishment

a. Concept of punishment, types of punishment
b. Retributive, Deterrent: Reformative Theory
c. Probation and Parole
d. Open Prison- Its Success and Failure

Unit-V: Terrorism

a Concept of Terrorism and Its Characteristics
b Origin of devlopment Terrorism
c Terrorism in India
d. Social and Legal Measures for Its Prevention and Control

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

FOURTH SEMESTER

Paper No. XVI/CC14 **Marks-100**

MODERN SOCIOLOGICAL THEORIES

Unit-I: Symbolic Interectionism

a. Origin and Basic Postulates
b. Contributions of G.H. Mead
c. Contribution of H.Blumer
d. Criticism

Unit-II: Phenomenology

a. Origin, Basic Postulates of Phenomenology
b. Contributions of Schutz
c. Contributions of Berger
d. Criticism

Unit- III: Ethnomethodology

a. Origin Basic postulates of Ethnomethodology
b. Contribution of Garfinkel
c. Contribution of Goffman
d. Criticism

Unit-IV: Critical Theory

a. Origin and Development
b. Contributions of Adorno
c. Contributions of Habermas
d. Criticism

Unit-V: Post Modernism

a. Origin and Development
b. Contributions of Foucault
c. Contributions of Derrida
d. Criticism

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References:

1. Abraham, M.F. 2001 — Modern Sociological Theory: An introduction Oxford, New Delhi
2. Adams, B.N. and Sydie, R.A. 2001 — Sociological Theory, Vistaar, New Delhi
3. Alexander, J.C. 1987 — Twenty lecturers: Sociological theories since world war-II Columbia Univ. Press New York
4. Apadurai, A. 1996 — Modernity at large: Cultural Dimensions of Globalisation University of Minnesota Press, Minneapolis
5. Bottomore, T. 1984 — The Frankfurt School, Tavistock, London
6. Bourdieu, P. 1995 — Sociology in Question, Sage, London.
7. Coser, L.A. 2001 — Masters of Sociological thought Rawat, Jaipur.
8. Collins, R. 1997 — Sociological Theory Rawat, Jaipur
9. Craib, I 1992 — Modern Social Theory; From parsons to habermas Harvester, London.

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Paper No. XVII/CC15 **Marks-100**

COMPARATIVE SOCIOLOGY

Unit-I: Historical and Social Context of Emergence of Sociology in the West

a. Emergence of growth of Sociology in West
b. . Emergence of growth of Sociology in India
c. Eurocentric Moorings Western Sociological Tradition
d. Americanization of Sociology

Unit-II: Central Themes in Comparative sociology

a. Modernity and Tradition
b. Diversity and multy Culturalism
c. Environment
d. Globalization

Unit-III: Theoretical Concern,s in Comparative sociology

a. Problems of theoring in sociology
b. Theoretical and Methodological approaches in sociology
c. Policy issues: Formulation and Evolution
d. new Trands of Morden Sociological Theory

Unit IV: Current Debates

a. Contextitualization
b. Indianization
c. Use of Native Categories
d. Criticism.

Unit-V: Debate on "For Sociology of India"

a. Sociology of India
b. Sociology in India
c. Sociology For India
d. Criticism

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References:

1	Anderski, S 1961:	Elements of Comparative Sociology(London , Widenfeld and Nicolson)
2	Beteille, Andre 1987:	Essays in Comparative Sociology(New Delhi: Oxford University Press)
3	Beteille, Andre 1992:	Society and Policies in India: Essays in Comparative Sociology(New Delhi: Oxford University Press)
4	Berremen, G.D 1981:	The Politocs of Truth : essays in Critical Anthopology, New Delhi: South Asian Publishers)
5	Dube, S. C. 1973:	Modernization and Development: The search for alternative paradigm (New Delhi: Vistar)
6	----------1973:	Social Sciences in a chanign society. Lucknow university press, Lucknow
7	Ferreira, J.V. and A.R.Momineds: 1983:	Nemesis–CulturalPerspectives on modernization (Bombay, Ramkrishna Publication)
8.	Genov, Nikolai, 1989:	National Traditions in Sociology (Delhi: Sage)
9	Kiely R and Phil Marfleet, eds. 1998:	Globalization and the third world (London: Routledge)
10	Kothari,Rajan1988 :	Rethinking Development: In search of Human Alternatives Delhi: Ajanta.
11	Kuper A 1996 :	Social Science Encyclopaedia, (London: Routledge)
12	MohanR.P and A.S.Wilke, eds.1994:	International Hand book of Contemporary Developments of Sociology (London : Mansell)
13	Oommen,T.K.& P.N. Mukherjee eds. 1986:	Indian Sociology: Reflection and Introspection popular, Mumbai.
14	Parekh, Bhikhu 2000	Rethinking Multiculturalism: Cultural Diversity and Political Theory (London: Macmillian)
15	Saraswati B.N.1994:	Interface of Cultural Identity and Development (New Delhi: Indira Gandhi National Centre of the Arts)
16	World Commiss ion on environment and Development, 1987:	(New Delhi: Oxford University Press)
17	Wallerstein, Immanuel 1974	Modern World System (New York: Oxford University Press

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Paper No. XVIII/CC16 **Marks-100**

CONTEMPORARY ISSUES IN INDUSTRY

Unit-I: Industrial Relation

a. Importance of Human Relations at work
b. Conflict: Causes and Types, Resolution of Conflict
c. Conciliation and Collective Bargaining
d. Workers Participation in Management

Unit-II: Trade Union and Industrialization

a. History of Trade Unionism in India
b. Objectives and Functions
c. ILO and Trade Unions in India
d. Trade Unionism in Globalization

Unit-III: Industry and Society

a. Impact of Industry on Family
b. Impact of Industry on Stratification
c. Industrialization and Migration
d. Industrialization and Religion

Unit-IV: **Industrilization in Third world Countries in the Era of Globlization**

a. FDI and Third World
b. International Agencies: World Bank and Third world countries
c. foreign Direct investment and third world
d. Status of Industries in Third World Countries

Unit-V: Contemporary Issues

a. Industrialization and Women Labour
b. Industrialization and Child Labour
c. Industrialization and Environment
d. Problem of Industrialization in Developing Countries

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References:

1.	Agrawal R.D. 1972	Dynamics of Indian labour relations in India (A Book regarding Mc-Graw Hill, Bombay)
2.	Aziz Abdul 1984	Labour problems of developing economy Ashis Publishing house, Hew Delhi
3.	Gilbert S.J. 1985	Fundamentals of Industrial Sociology Tata Mc-Graw hill Bombay
4.	Karnik V.B. 1990	Indian trade Union A survey, Popular Prakashan-Bombay
5.	Laxmana, C et al 1990	Workers Participation and industrial democracy: Global perspectives: Ajanta publication, New Delhi.
6.	Memoria, C.B. and Memoria 1992	Dynamics of Indian Relations in India Himalaya publishing house: Mumbai
7.	Miller, D.c. and Farm W.M. 1964	The Sociology of Industry George Allen and Onwin, London
8.	Philip H and Mellissa T 2001	Work Post Modernism and organization Sage, New Delhi
9.	Ramaswamy E.A. 1977	The worker and His union, Allied New Delhi
10.	_____, 1978	Industrial Relations in India OUP, new Delhi
11.	Thiwait, P.K. 1987	Social Structure of a Planned Town, Institute of Social Research and Applied Anthropology, Calcutta.
12.	Watson K. Tony 1995	Sociology, work and industry Routlodge and Kagan Paul, London.

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Paper No.-XIX/CC17 **Marks-100**

CRIMINOLOGY: CORRECTIONAL AND ADMINISTRATION

Unit-I: Roots of Correction to prevent Crime

a. Socialization
b. Family values
c. Role of education
d. Ethics

Unit-II: Correction and It's Forms

a. Meaning and Significance of Correction; Prison Based and Community Based
b. Correctional Programmes in Prison; History of Prison Reforms in India
c. Correctional Programmes – Meditation and recreation
d . After Care and Rehabilitation Programme.

Unit-III: Problem of Correctional Administration

a. Antiquated jail manual and prison act
b . Overcrowding; Lack of Inter Agency Co-Ordination among Police Prosecution, Judiciary and Prison
c. Prison Offences
d. Problem of Criminal Justice Administration

Unit-IV: Victimological Perspective

a. Victrim's Responsibility in Crime
b. Violation of Prisoner's Human Rights
c. Problems of Women Offenders.
d. Compaction Victrim's

Unit-V: Policing and Juliciaring

a. Concept and Objectives of Police
b. Types/ Role of Police
c. Concept of Juliciaring
d. Role of Juliciaring

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References:

1.	Ahuja, R. 1981	The Prison System Sahitya Bhawan, Agra
2.	_____, 1997	Contemporary Social problems in India Rawat, Jaipur.
3.	Advani, NH, 1978	Perspectives on Adult Crime and correction. Abhinav Publication, New Delhi
4.	Bedi, K. 1998	It is always possible sterling, New Delhi.
5.	Devasia, L and Devasia, V.V. (ed) 1989	Female Criminals and female victims. . An Indian Perspective Dattsons, Nagpur
6.	Gosmami, B.K. 1983	Criminology and Penology Allahabad
7.	Mohanty, S 1990	Crime and Criminals in India Ashish Pub. House New Delhi.
8.	Reid, S. 1976	Crime and Criminology Deydan press, Illinayse
9.	Shankardas, R.D. 2000	Punishment and the Prison: India and International perspective, Sage, New Delhi.
10.	Sutherland, E.H. and Donald, R.C., 1968	Principles of Criminology the Times of India Press, Bombay.
11.	William, H.E. 1990	The correction Profession Sage, New Delhi.

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Paper No.-XX/P3 **Marks-100**

PROJECT REPORT

On Rural and Urban Problems

Scheme of Evaluation- 50% by Internal Examiner and rest 50% by Viva-Voce Examination evaluated both by the Internal and External Examiner.

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10/6/2019

10.06.2019

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.Com. (Semester Exam)

UNDER

FACULTY OF COMMERCE

Session 2019-21

(Approved by Board of Studies)

Effective from July 2019

एम.कॉम. सेमेस्टर परीक्षा
पाठ्यक्रम (सत्र 2019–21से लागू)
M. Com. Ist Semester

प्रश्न पत्र	प्रश्न पत्र का नाम	पूर्णांक	पेपर
प्रश्नपत्र I Paper I	प्रबंधकीय अर्थशास्त्र Managerial Economics	80+ 20	101
प्रश्नपत्र II Paper II	वृहत (उच्चतर) लेखांकन Advanced Accounting	80+ 20	102
प्रश्नपत्र III Paper III	आयकर विधान एवं लेखे (Income Tax Law and Accounts)	80+ 20	103
प्रश्नपत्र IV Paper IV	सांख्यिकीय विश्लेषण Statistical Analysis	80+ 20	104
प्रश्नपत्र V Paper V	निगमित विधि संरचना Corporate Legal Framework	80+ 20	105

M.Com. IIst Semester

प्रश्न	प्रश्न पत्र का नाम	पूर्णांक	पेपर
प्रश्नपत्र VI Paper VI	व्यवसायिक अर्थशास्त्र Business Economics	80+20	201
प्रश्नपत्र VII Paper VII	विशिष्टिकृत लेखांकन Specialized Accounting	80+20	202
प्रश्नपत्र VIII Paper VIII	कर नियोजन एवं प्रबन्ध (Tax Planning and Management)	80+20	203
प्रश्नपत्र IX Paper IX	उच्चतर सांख्यिकी Advanced Statistics	80+ 20	204
प्रश्नपत्र X Paper X	व्यावसायिक सन्नियम Business Laws	80+ 20	205

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M. Com. Ist Semester
PAPER-I
MANAGERIALECONOMICS

M.M.80+20

OBJECTIV:

This course develops managerial, perspective to economic fundamentals as aids to decision making under given environmental constraints.

COURSE INPUTS:

UNIT-1 Nature and Scope of Managerial, Economics: Objective of a firm; Economics theory and managerial theory; Managerial economist's role and responsibilities.

UNIT-2 Fundamental economic concepts-incremental principle, opportunity cost principle, discounting principle. equimarginal principle.

UNIT-3 Demand Analysis: Individual and Market demand functions Law of demand; determinants of demand; Elasticity of demand-its meaning and importance, Price elasticity; income elasticity and cross elasticity; Using elasticity in managerial decisions.

UNIT-4 Theory of consumer Choice: Cardinal utility approach, indifference approach, revealed preference and theory of consumer choice under risk; Demand estimation for major consumer durable and non-durable products; Demand forecasting tech. technique.

UNIT-5 Production Theory: Production function-production with one and two variable inputs, Stages of production; Economics of scale; Estimation of production function.

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PAPER – II
ADVANCED ACCOUNTING

M.M.80+20

OBJECTIVE: -

The objective of this course is to expose students to accounting issues and practices such as maintenance of company accounts and handling accounting adjustments.

COURSE INPTS:

UNIT-1 Accounting for issue, Forfeited and redemption of shares and debentures.

UNIT-2 Final accounts and financial statements of companies.

UNIT-3 Accounting issues relative to amalgamation and reconstruction of companies.

UNIT-4 Accounting for holding and subsidiary companies.

UNIT-5 Accounts relating to Liquidation of companies.

REFERENCES.

Beams, F.A.: Advanced Accounting, Prentice Hall, ,New Jersey., Dearden, J. and S.K. Bhattacharya : Accounting for Management, Vikas Publishing House, New Delhi. Engler, C.L.A Bernstein. and K.R. Lambert: Advanced Accounting, with Chicago. Fischer, P.M.,W.J. Taylor and J.A. Leer: Advanced Accounting, South-Western, Ohio. Gupta. R.L.: Advanced Financial Accounting, S. Chand & Co., New Delhi. Keiso D.E. and J.J. Weygand: Intermediate Accounting, John Wiley and Sons, NY. Maheshwari, S.N.: Advanced Accountancy-Vol.II Vikash Publishing House, New Delhi Monga, J.R. : Advanced Financial Accounting, Mayoor Paperbacks, Noida Narayanaswamy, R: Financial Accounting: A Managerial Perspective, Prentice Hall of India, Delhi. Neigs, R.F. : Financial Accounting. Tata McGraw Hill, New Delhi. Shukla, M.G. 'and T.S. Grewal: Advanced Accou'ntancy, Sultan Chand & Co. New Delhi. Warren, C.S. and P.E. Fess: Principles of Financial and Managerial Accounting, South Western, Ohio.

RECOMMENDED BOOKS:

1. Plekles and Duakerley	:	Accountancy
2. Wilson	:	Company Accounts
3. Diskson	:	Accountancy
4. J.R. Batlboi	:	Advanced Accounting
5. R.R. Gupta	:	Advanced Accounting
6. S.M. Shukla	:	Advanced Accounting
7. Shukla and Grewal	:	Advanced Accounting
8. H Chakravarty	:	Advanced Accounts
9. Dr. Shukla Avam Agrawal	:	Advanced Accountancy
10. Dr.S.S. Gupta	:	Advanced Accounts
11. Dr. Karim ,Dr. Khanuja & Pro. Mehata	:	Advanced Accounting
12. डॉ. करीम, डॉ. खनूजा एवं प्रो.मेहता	:	वृहत लेखाकर्म
13. जे. के. अग्रवाल तथा आर.के.अग्रवाल	:	उच्च वित्तीय एवं कम्पनी लेखांकन
14. आर.के. गुप्ता	:	उन्नत लेखांकन
15. Basu Das	:	Advanced Accounting

M. Com – 1st Semester

आयकर विधान एवं लेखे (प्रश्नपत्र – III)

Income Tax Law and Accounts (Paper –Third)

M.M.:80

OBJECTIVE

The objective of this course is to help student Understand and conceptual framework of Income tax.

Unit – I	**Law relating to Income tax:** Brief study of the main provisions of the Indian Income Tax Act. Important definitions. Income exempted from tax, Residence and Tax liability.
Unit – II	**Calculation of taxable income under the head :** Salary and House property.
Unit – III	**Depreciation and Development allowance, Calculation of taxable Income under the head:** Business and Profession, capital gains, income from other sources.
Unit – IV	Set off and carry forward of losses, Deduction from gross total Income Calculation of taxable Income and tax of an individual, and Hindu undivided Families.
Unit – V	Appeals & Revisions Reference of High Court and Supreme court, offences & penalties, Income tax authorities.

M. Com – 1st Semester

(Compulsory) Paper – IV

STATISTIC ALANALYSIS

M.M.:80

OBJECTIVE

The Objective of this course is to help student learnt application of statistical tools and techniques for decision making.

UNIT-1 **Statistics -** Definitions, Characteristics, Scope and Nature, Functions, limitations, Distrust and misuse importance & Statistical Investigations., Classification & Tabulation,

UNIT-2 **Data Sources:** Primary and Secondary, Primary data collection techniques, Schedule, Question naire and interview & Sources' of Secondary data.

UNIT-3 Dispersion, Co-efficient of variance and skewness, correlation Karl- Parsons and spearman's ranking method and Regression analysis, Two variables case.

UNIT-4 Probability Theory: Probability classical, relative and subjective probability, Addition and multiplication probability models - Conditional probability and Baye's Theorem.

UNIT-5 Probability Distributions-Bionomial, poisson and Distributions, Their characteristics and applications.

M.Com-1st Semester

UNDER MANAGEMENTBOARD

(Compulsory)

Paper – V

(Paper Code)

CORPORATELEGALFRAMEWORK

M.M.:80

OBJECTIVE

The Objective of this course is provide knowledge of relevant provisions of various Semester laws influencing business operations.

UNIT-1 The Companies Act, **2013** (Relevant Provisions): Definition, types of companies Memorandum of association; Articles of association; Prospectus; Share capital and membership.

UNIT-2 Meeting sander solutions-Company management; Managerial remuneration; Winding up and dissolution of companies.

UNIT-3 The Negotiable Instruments Act,1881-Definition, types of negotiable instruments; Negotiation; Holder and holderin due course; payment in due course;

UNIT-4 Endorsement and crossing of cheque; Presentation of negotiable instruments.

UNIT-5 Legal Environment for Security Markets: SESI Act. 1992-organisation and Objectives of SESI

M.Com. IIst Semester

PAPER – VI

BUSINESSECONOMICS

M.M.80+20

OBJECTIVE:

This course develops managerial perspective to economic fundaQ1entals' as aids to decision making under given environmental constraints.

UNIT-1 Cost Theory and Estimation, economic value analysis, Short and long run cost Functions-their nature, shape and inter-relationship; Law of variable proportions;- Law of returns to scale.

UNIT-2 Price Determination under Different Market Conditions: Characteristics of different market structures; Price determination and firm sequilibriumin short-run and long-run under perfect competition, monopolistic competition, oligopoly and monopoly,

UNIT-3 Pricing Practices: Methods of price determination in practice, pricing of multiple products; pricedis crimination; International pricedis crimination and dumping; Transfer pricing.

UNIT-4 Business Cycles: Nature and phases of la business. cycle; The ories of businesss cycles- psychological, profit, monetary, innovation, cobweb, Samuelson and Hicks theories.

UNIT-5 Inflation: Definition, Characteristics and types; Inflation interms of dem and pull and cost – push factors; Effects of inflation.

PAPER -VII

SPECIALISEDACCOUNTING

M.M.80+20

OBJECTIVE.

The objective of this course-is to expose students to accounting issues and practices such asmaintenance of company accounts and handling accounting adjustments.

UNIT-1 Accounts of General Insurance Companies.

UNIT-2 Accounts of Banking Companies.

UNIT-3 Accounts of Public Utility concerns: Double Accounts System.

UNIT-4 Royalty accounts.

UNIT-5 Investment accounts.

M. Com – 2nd Semester

कर नियोजन एवं प्रबन्ध (प्रश्नपत्र –VIII)

TAX PLANNING AND MANAGEMENT

(Paper –VIII)

M.M. 0:80

OBJECTIVE –

This course aims at making students conversant with the concept of corporate tax planning and Indian tax laws, as also their implications for corporate management.

Unit – I	Calculation of taxable Income and tax of Firm and Companies.
Unit – II	Return of Income, Provisional Regular, Expert and emergency assessment, Re opening of assessment.
Unit – III	Concept of tax Planning ; Tax avoidance and tax evasions ; Tax planning with reference of location, nature and form of organization of new
Unit – IV	Tax planning to capital structure, decision dividend policy; Inter corporate dividends and bonus shares.
Unit – V	Preparation of income tax returns, Computation of Income tax, Tax deduction at source; Advance payment of tax.

(Compulsory)

Paper-IX

(Paper Code)

ADVANCESTATISTICS

M.M.:80

OBJECTIVE

The Objective of this course is to help student learn the application of statistical tools and techniques for decision making.

UNIT-1 Statistical Decision Theory: Decision environment, Expected profit under uncertainty and assigning probabilities and utility theory.

UNIT-2 Statistical Estimations. And Testory: Point and intervals timation of population Mean, proportion and variance Statistical Testing-Hypothesis and Errors, Samplesize-Large and Small Sampling test Z tests, T Tests & F Tests.

UNIT-3 Association of Attributes: Two Attributes, consistency of data, measurement of Association of Attributes - Percentage method, Co-efficient of Association, Comparison of Actual and (you Iemethod) Expected frequency's & Issusery Association.

UNIT-4 Statistical Quality Control: Causes of Variations in quality characteristics, Quality Control Charts-purpose and logic, Process under control and out of control, warning limits, control charts for attributes – fraction defectives and number of defects, Acceptance sampling.

UNIT-5 Interpolation and Extrapolation – Prabolic Bionomial, Newton and long rages method.

(Compulsory) Paper – X
Business Laws

M.M. 80

OBJECTIVE

The Objective of this course is providing knowledge of relevant provisions of various laws influencing business operations.

UNIT-1 SEBI Act-1992: Organization and objectives of SEBI, Functions and Role of SEBI Rights and Power of SEBI.

UNIT-2 MRTP Act 1969: Monopolistic Trade Practice Meaning, essentials, Restrictive Trade Practices-Meaning, Unfair trade practice, MRTP commission of fences and Penalties.

UNIT-3 Consumer Protection Act 1986: Needs of Act, Rights of consumers, Objectives of Act., Grievance redressal Machinery, District Forum, State Commission, National Commission.

UNIT-4 FEMA Act 1999: Objectives; Regulation and Management of FEMA, Penalties Appeal.

UNIT-5 W.T.O.: Brief History of WTO, Objectives and Functions, Organisation, W.T.O. and India, Regional groupings, anti-dumping duties and other NTBs, Doha declaration Dispute settlement system, TRIP, TRIMS and GATS.

M. Com. IIIrd Semester
(Compulsory Papers)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – I प्रश्नपत्र –I	प्रबन्ध की अवधारणा (Management Concept)	80+20	301
Paper – II प्रश्नपत्र –II	संगठनात्मक व्यवहार (Organisational Behaviour)	80+20	302
Paper – III प्रश्नपत्र –III	उच्चत्तर लागत लेखांकन (Advance Cost Accounting)	80+20	303
Paper – IV प्रश्नपत्र –IV	प्रबंधकीय लेखांकन (Management Accounting)	80+20	304
Paper – V प्रश्नपत्र –V	प्रबंधकीय निर्णय के लिए लेखांकन (Accounting for managerial decision)	80+20	305

M.Com Vth Semester

Special attention to the Students. Students are required to select any one Specialization out of four suggested below.

Optional – Specialization

Optional Group	–	(A)	Marketing
Optional Group	–	(B)	Management
Optional Group	–	(C)	Banking and Insurance
Optional Group	–	(D)	Taxation and Accounting
Optional Group	–	(A)	विपणन (Marketing)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – A I प्रश्न पत्र–A I	विपणन के सिद्धान्त (Principle of Marketing)	80+20	401
Paper – A II प्रश्न पत्र–A II	विज्ञापन एवं विक्रय प्रबन्ध (Advertising & Sales Management)	80+20	402
Paper – A III प्रश्नपत्र–A III	विपणन अनुसन्धान (Marketing Research)	80+20	403
Paper – A IV प्रश्नपत्र –A IV	अन्तर्राष्ट्रीय विपणन (International Marketing)	80+20	404

Optional Group– (B)
प्रबन्ध (Management)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – B I प्रश्न पत्र –B I	वित्तीय प्रबन्ध (Financial Management)	80+20	411
Paper – B II प्रश्न पत्र –B II	कार्मिक प्रबन्ध (Personnel Management)	80+20	412
Paper – B III प्रश्न पत्र–B III	उत्पादन प्रबन्ध (Production Management)	80+20	413
Paper – B IV प्रश्न पत्र–B IV	व्यूहरचना प्रबन्ध (Strategic Management)	80+20	414

Optional Group–(C)
बैंकिंग एवं बीमा (Banking and Insurance)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – C I प्रश्न पत्र–C I	बैकिंग व्यवहार (Banking Practices)	80+20	421
Paper – C II प्रश्न पत्र–C II	भारत में बैंकिंग संस्थाए (Banking Institution in India)	80+20	422
Paper – C III प्रश्न पत्र–C III	जीवन बीमा (Life Insurance)	80+20	423
Paper – C IV प्रश्न पत्र–C IV	सामान्य बीमा (General Insurance)	80+20	425

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Optional Group–(D)

करारोपण एवं लेखांकन

(Taxation and Accounting)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – D I प्रश्न पत्र–D I	भारत में प्रत्यक्ष कर (Direct Tax in India)	80+20	431
Paper – D II प्रश्न पत्र–D II	अप्रत्यक्ष कर (Indirect Tax)	80+20	432
Paper – D III प्रश्न पत्र–D III	सेवा के क्षेत्र में लेखांकन (Accounting in Service Sector)	80+20	433
Paper – D IV प्रश्न पत्र–D IV	लेखांकन पद्धतियाँ (Accounting Methods)	80+20	434

Optional Group–(E)

व्यसायिक वातावरण एवं वित तथा शोघ

(Business Environment & Finance and Research)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – E I प्रश्न पत्र– E I	व्यसायिक वातावरण (Business Environment)	80+20	431
Paper – E II प्रश्न पत्र– E II	वित्तीय संस्थाएं (Financial Institutions)	80+20	432
Paper – E III प्रश्न पत्र– E III	शोघ प्रविधि (Research Methodology)	80+20	433
Paper – E IV प्रश्न पत्र–E IV	प्रतिभूति विश्लेषण (Security Analysis)	80+20	434

महत्वपूर्ण नोट :

सत्र 2014–15 से एम. कॉम. प्रथम, द्वितीय एवं तृतीय सेमेस्टर में सभी प्रश्न–पत्र अनिवार्य होंगें। उक्त परीक्षा में वैकल्पिक प्रश्न–पत्र चयन की व्यवस्था नहींहोगी।

एम. कॉम. चतुर्थ सेमेस्टर में विशिष्टिकरण समूह (A), (B), (C), (D) या (E) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न–पत्र अनिवार्य रूप सेलेने होंगें।

एम. कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबन्ध विषय से सम्बन्धित होगा।

सभी प्रश्न–पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आन्तरिक मूल्यांकन परीक्षा होगी। आन्तरिक मूल्यांकन के अंक परीक्षार्थियों की उपस्थिति, सेमीनार, शोध एवं शैक्षणिक कार्य में भागिता, इकाईवार मूल्यांकन परीक्षा आदि के आधार पर प्रदान किये जायेंगे।

आन्तरिक परीक्षा एवं बाह्य परीक्षा में प्रश्नपत्रवार न्यूनतम उत्तीर्णांक 20: होगा। जो अध्यादेश क्रमांक 170 के प्रावधानों के अनुसार बंधनकारी होगा।

Optional Group–(E)

व्यापार पर्यावरण एवं वित्त और अनुसंधान

(Business Environment & Finance & Research)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – E I प्रश्न पत्र– EI	व्यापार पर्यावरण (Business Environment)	80+20	431
Paper – E II प्रश्न पत्र– EII	वित्तीय संस्थाए (Financial Institution's)	80+20	432
Paper – E III प्रश्न पत्र–EIII	अनुसंधान क्रियाविधि (Research Methodology)	80+20	433
Paper – E IV प्रश्न पत्र–EIV	सुरक्षा विश्लेषण (Security analysis)	80+20	434

20/6/19 20/6/19 20/6/19

M. Com. Third Semester

(Compulsory Paper)

एम. कॉम. तृतीय सेमेस्टर

अनिवार्य प्रश्नपत्र प्रबन्ध की अवधारणा

(प्रश्नपत्र प्रथम)

MANAGEMENT CONCEPT

(Paper First)

M.M. :80

OBJECTIVE -

The Objective of this course is to help student understand and conceptual framework of management and organizational behaviour.

Unit – I	**Schools of Management Thought :** Scientific, process, human behaviour and social system school; Decisiontheory school; Quantitative and system school; Contingency theory of management; Functions of a manager.
Unit – II	**Managerial Functions :** Planning - concept, significance, types; Organizing - concept, principles of authority, theories, types of organizations, authority, responsibility, power, delegation, decentralization;
Unit – III	**Staffing; Directing; Coordinating; Control -** nature, process, and techniques.
Unit – IV	**Motivation :** Process of motivation; Theories of motivation - need hierarchy theory, theory X and theory Y, two factor theory, Alderfer's ERG theory, McCleland's learned need theory, Victor Vroom's expectancy theory, Stacy Adams equity theory.
Unit – V	**Group Dynamics and Team Development :** Group dynamics - Definition and importance, types of groups, group formation, group development, group composition, group performance factors; Principle-centered approach to team development.

संठनात्मक व्यवहार (प्रश्नपत्र द्वितीय)

ORGANIZATIONAL BEHAVIOUR (Paper – Second)

M.M. : 80

OBJECTIVE -

The Objective of this course is to help student understand and conceptual framework of management and organizational behavior.

Unit – I	**Organizational Behaviour:** concept and significance; Relationship between management and organizational behaviour; Emergence and ethical perspective; Attitudes; Perception; Learning; Personality; Transactional analysis.
Unit – II	**Leadership:** Concept; Leadership styles; Theories - trait theory, behavioural theory, Fielder's contingency theory; Harsey and Blanchard's situational theory; Managerial grid; Likert's four systems of leadership.
Unit – III	**Organizational Conflict:** Dynamics and management; Sources, patterns, levels, and types of conflict; Traditional and modern approaches to conflict; Functional and difunctional organizational conflicts; Resolution of conflict.
Unit – IV	**Interpersonal and Organizational Communication:** Concept of two-way communication; Communication process; Barriers to effective communication; Types of organizational communication; Improving communication; Transactional analysis in communication.
Unit – V	**Organizational Development:** Concept; Need for change, resistance to change; Theories of planned change; Organizational diagnosis; Organizational Development intervention.

M. Com – 3rd Semester

उच्चत्तर लागत लेखांकन (प्रश्नपत्र तृतीय)

ADVANCED COST ACCOUNTING (Paper–Third)

M.M.:80

OBJECTIVE -

This course exposes the students to the basic concepts and the tools used in cost accounting.

Unit – I	**Introduction –** Cost Analysis, concepts and classification, Materials control– Techniques of Materials control.
Unit – II	**Labour cost –** Computation and control, Overheads – Accounting and Control.
Unit – III	Job, Batch, Contract Costing and operating costing.
Unit – IV	**Process Costing, Joint products & By –** products costing. Uniform costing and Estimate costing.
Unit – V	**Budgetary control –** Importance of budgets in accounting. Nature of budgetary control, Organization for budgetary control preparation zero base budgeting, performance budgeting. Cash Budget, Production and sales Budget.

Paper – IV

प्रबंधकीय लेखांकन

(Management Accounting)

OBJECTIVE:

The objective of this course is to acquaint student with the accounting concepts, tools and techniques for managerial decisions.

COURSE INPUTS-

UNIT-1 Introduction of Accounting: Management accounting as a area accounting; Objectives, nature and scope of management accounting, techniques of management accounting, difference between financial accounting, cost accounting and management accounting, Management accounting and managerial decisions; Management accountant's position, role and responsibilities.

UNIT-2 Accounting Plan and Responsibility Centers: Meaning and significance of responsibility accounting; Responsibility centers-cost centre, profit centre and investment centre, Problems in transfer pricing, Objectives and determinates of responsibility centers.

UNIT-3 Budgeting: Definition of Budget; Essentials of budgeting; Types of budgets functional, master etc. Fixed and flexible budget.

UNIT-4 Standard Costing and Variance Analysis:, Standard costing as a control technique; Setting of standards and their revision; Variance analysis – meaning and importance; Kinds of variances and their uses material, labour and over head variances; Disposal: of variances; Relevance of variance analysis to budgeting and standard costing.

UNIT-5 Marginal Costing: Concept of marginal cost; Marginal costing and absorption, costing, Marginal costing versus direct, costing;

REFERENCE:

Anthony, Robert: Management Accounting, Tarapore-wala, Mumbai. Barfield, Jessie, Ceily A. Raiborn and Michael R. Kenney: Cost Accounting: Traditions and Innovations, South- Western College Publishing, Cincinnati, Ohio. Decoster, Don T. and Elden L. Schafe: Management Accounting: A Decision Emphasis, John Wiley and SO, nsInc., New York.

Garrison, Ray H. and EricW. Noreen: Managel11el t Accounting, Richard D. Irwin, Chicago. Hansen, Don R. And Maryanne M. Moreen: Management Accounting, South-Western College Publishing, Cincinnati, Ohio.

Horngran, C.T., GaryL. Sundem and William O. Stratton': Introduction to Management Accounting, Prentice Hall, Delhi.

Horngren,CharlesT.,GeorgeFosterandSrikantM.Dalior:CostAccounting:AManagerial Emphasis, Prentice Hall, Delhi.

Lall, B.M. and I.C. Jain: Cost Accounting: Principles and Practice, Prentice Hail,

Delhi.

Pandey. I.M.: Management Accounting, Vani Publication, Delhi.

Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon: Budgeting, Profit Planningan Control, Prentice Hall, Delhi

BOOKSRECOMMENDED:

1.	Anthony Robert N	:	Management Accounting
2.	Gillet	:	Management and the account
3.	Willsmore	:	Business, Business Budget and Budgetary Control
4.	Rose U. Fahri	:	Higher Management Control
5.	Guthmann H.G.	:	Analsy of finan Qial Statement
6.	Smith and Ashburn	:	Financial and Administrative Accountancy
7.	Pinkless and Duakaraley	:	Accountancy
8.	Manmohan A:Goyal	:	Management Accounting
9.	जे.के. अग्रवाल, आर. के. अग्रवाल	:	प्रबंधकी लेखांकन
10.	ए.पी. गुप्ता	:	प्रबंधकीय लेखांकन
11.	एस.एन. माहेश्वरी	:	प्रबंध लेखांकन
12.	के.जी. गुप्ता	:	प्रबंधकीय लेखांकन
13.	एम.आर.अग्रवाल	:	प्रबंधकीय लेखांकन
14.	पी. मिश्रा	:	प्रबंध लेखांकन
15.	डॉ.बी.पी.अग्रवाल,डॉ.मेहता	:	प्रबंधकीयलेखाविधि

M. Com – 3rd Semester

Paper – V

प्रबंधकीय निर्णय के लिए लेखांकन

(Accounting for managerial decisions)

OBJECTIVE

The objective of this course is to acquaint student with the accounting concepts, tools and techniques for managerial decisions.

COURSE INPUTS-

UNIT-1 Break-even-analysis; Assumptions and practical applications of break- even-analysis; cost volume profit analysis, Decisions regarding sales-mix, make or buy decisions and discontinuation of a product line etc.

UNIT-2 Analyzing financial Statements: Method, objects and ratio analysis.

UNIT-3 Cash flow analysis and Fund flow analysis.

UNIT-4 Contemporary Issues in Management Accounting: Value chain analysis; Activity bases costing, Quality costing, Target and lifecycle costing.

UNIT-5 Reporting to Management: Objectives of reporting, reporting needs at different managerial levels; Types of, reports," modes of reporting; reporting at different levels of management.

REFERENCE: -

Anthony, Robert: Management Accounting, Tarapore-wala, Mumbai. Barfield, Jessie,. Ceily A. Raiborn and Michael R. Kenney: Cost Accounting: Traditions and Innovations, South-Westrn College Publishing, Cincinnati, Ohio. Decoster, Don T. and Elden L. Schafe: Management Accounting: A Decision Emphasis, John Wiley and Sons Inc., New York. Garrison, Ray H. and Eric W. Noreen: Management Accounting, Richard D. Irwin, Chicago. Hansen, Don R. and Maryanne M. Moreen: Management Accounting, South-Western College Publishing, Cincinnati, Ohio.

Horngran, C.T., Gary L. Sundem and William O. Stratton: Introduction to Management Accounting; Prentice. Hall, Delhi.

Horngren, Charles T., George Foster and Srikant M. Dalior: Cost Accounting: A Managerial Emphasis, Prentice Hall, Delhi. Lall, B.M. and I.C. Jain: Cost Accounting: Principles and Practice, Prentice Hall, Delhi. Pandey I.M.: Management Accounting, Vani Publication, Delhi.

Welsch Glenn A. Ronald W. Hilton and Paul N. Gordon: Budgeting, Profit Planning and Control Prentice Hall, Delhi:

BOOKS RECOMMENDED:

Anthony Robert N.	:	Management Accounting
Gillet	:	Management and the account
Willsmore	:	Business, Business Budget and Budgetary Control
Rose U. Fahri	:	Higher Management Control .
Guthrnann H.G.	:	Analsy of financial Statement
SmithandAshburn	:	Financial and Administrative Accountancy
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Manmohan A. Goyal	:	Managemeht Accounting
जे. के. अग्रवाल, आर. के. अग्रवाल	:	प्रबंधकीय लेखांकन
ए. पी. गुप्ता	:	प्रबंधकीय लेखांकन
एस. एन. माहेश्वरी	:	प्रबंध लेखांकन
के. जी. गुप्ता	:	प्रंबंधकीय लेखांकन
एम. आर. अग्रवाल	:	प्रबंधकीय लेखांकन
पी. मिश्रा	:	प्रबंध लेखांकन
डॉ. बी. पी. अग्रवाल	:	डॉ. मेहताः प्रबंधकीय लेखाविधि

एम.कॉम. चतुर्थ सेमेस्टर –**(M. Com. Fourth Semester)**

विशिष्टिकरण : **(A)** विपणन

Specialization: (A) Marketing

(1) विपणन के सिद्धान्त (प्रश्नपत्र –**: A –** प्रथम)

PRINCIPLE OF MARKETING (Paper –: A - First)

M.M.: 80

OBJECTIVE–

The Objective of this course is to facilitate understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints.

Unit – I	Introduction – Meaning, nature, scope and importance of marketing; Marketing concept and its evolution; Marketing mix; Strategic marketing planning – an overview.
Unit – II	Market Analysis and Selection – Marketing environment – macro and micro components and their impact of marketing decisions; Market segmentation and positioning; Buyer behavior; Consumer versus organizational buyers; Consumer decision – making process.
Unit – III	Product Decisions – Concept of a product; Classification of products; Major product decisions; Product line and product mix; Branding; Packaging and labeling ; Product lifecycle – strategic implications ; New product development and consumer adoption process.
Unit – IV	Pricing Decisions – Factors affecting price determination; Pricing policies and strategies; Discounts and rebates.
Unit – V	Distribution Channels and Physical Distribution Decisions – Nature, functions, and types of distribution channels; Distribution channel intermediaries; Channel management decisions; Retailing and wholesaling. Physical Distribution Management.

(1) विज्ञापन एवं विक्रय प्रबन्ध – (प्रश्नपत्र : A – द्वितीय)

ADVERTISING & SALES MANAGEMENT (Paper: A – Second)

M.M.:80

Unit – I	Introduction: Concept, Scope, Objectives and Functions of Advertising. Role of Advertising in marketing mix and the advertising process. Legal, ethical and social aspect of advertising.
Unit – II	Pre-launch Advertising Decision: Determination of target audience, Advertising Media and their choice. Advertising messages, Layout of advertisement and Advertising Appeal, Advertising Copy.
Unit – III	Promotional Management: Advertising Department, Role of Advertising Agencies and their Selection, Advertising Budget, Evaluation of Advertising Effectiveness.
Unit – IV	Personal Selling: Meaning and Importance of Personal Selling, - Difference between Personal Selling, Advertising and Sales Promotion. Methods and Procedure of Personal Selling.
Unit – V	Sales Management: Concept of Sales Management, Objectives and Functions of Sales Managements. Sales Organization, Management of Sales force and Sales force objectives, Sales force Recruitment: - Selection, Training, Compensation and Evaluation.

(3) विपणन अनुसंधान (प्रश्नपत्र : A – तृतीय)

MARKETING RESEARCH (Paper: A – Third)

M.M.:80

Unit – I	Marketing Research: An Introduction; Marketing Decisions; Marketing Research and Information System.
Unit – II	Marketing Research Methodology, Research Design.
Unit – III	Organization of Marketing Research. Specialized areas of application of marketing research.
Unit – IV	Specialized Techniques of Marketing Research. Motivation Research.
Unit – V	Advertising Research: Planning and Procedure, New Product Research.

(4) अंतर्राष्ट्रीय विपणन (प्रश्नपत्र : A – चतुर्थ)

INTERNATIONAL MARKETING (Paper : A – Fourth)

M.M.:80

Unit – I	International Marketing; Meaning; Scope, benefits and difficulties of International Marketing: International marketing and Domestic Marketing, reasons for entering International marketing. International marketing environment; Identifying and selecting foreign market.
Unit – II	Foreign market entry mode: Product designing, standardization Vs. Adaptation; Branding, Packaging and Labeling.
Unit – III	Quality issues and after sales service; International pricing; International price quotation; payment terms and methods of payment.
Unit – IV	Promotion of products and services abroad: International channels of distribution; Selection and appointment of foreign sales agents. Logistic decision.
Unit – V	Export policy and practices in India, Trends in India's foreign trade, steps in starting export business; Export finance, documentation and procedure.

विशिष्टिकरण : **(B) प्रबन्ध**

Specialization: (B) Management

(1) वित्तीय प्रबन्ध (प्रश्नपत्र – : **B** प्रथम)

FINANCIAL MANAGEMENT (Paper: B -First)

M.M.:80

OBJECTIVE

The objective of this course is to help students of understand the conceptual framework of financial management, and is applications under various environmental constraints.

COURSE INPUTS

Unit – I	**Financial Management:** Meaning, nature and scope of finance; Finance functions - investment, financing and dividend decisions. **Capital Budgeting:** Nature of investment decisions; Investment evaluation criteria - net present value, internal rate of return, profitability index, payback period, accounting rate of return; NPV and IRR comparison; Capital rationing; Risk analysis in capital budgeting.
Unit – II	**Cost of Capital:** Meaning and significance of cost of capital; Calculation of cost of debt, preference capital, equity capital and retained earnings; Combined cost of capital (weighted); Cost of equity and CAPM.
Unit – III	**Operating and Financial Leverage:** Measurement of leverages; Effects of operating and financial leverage on profit; Analyzing alternate financial plans; Combined financial and operating leverage. **Capital structure Theories:** Traditional and M.M. hypotheses - without taxes and with taxes; Determining capital structure in practice.

Unit – IV	**Dividend Policies:** Issues in dividend decisions, Walter's model, Gordon's model, M-Mhypothesis, dividend and uncertainty, relevance of dividend; Dividend policy in practice; Forms of dividends; Stability in dividend policy; Corporate dividend behavior.
Unit – V	**Management of Working Capital:** Meaning, significance and types of working capital; Calculating operating cycle period and estimation of working capital requirements; Financing of working capital and norms of bank finance; Sources of working capital; Factoring services; Various committee reports on bank finance; Dimensions of working capital management. Management of cash, and inventory.

(2) सेविवर्गीय प्रबन्ध (प्रश्नपत्र : B – द्वितीय)

PERSONNEL MANAGEMENT (Paper: B – Second)

M.M. :80

Unit – I	Concept, Definition, Importance & Objectives of Personnel Management, Historical Development of Personnel Management, Nature, scope planning, Philosophy and Principles of personnel Management and its relation with behavioral sciences.
Unit – II	Personnel policies, programmers &procedures. Personnel Department; Personnel Functions, Position of personnel Department & Organization of Personnel Management.
Unit – III	Man power planning Recruitment and Selection, Training & Development of Employees & Executives. Promotion, Demotion, Transfers, Absenteeism & Turnover.
Unit – IV	Performance Appraisal and Merit Rutting, Discipline. Job evaluation Wage & Salary Administration, plans of Remuneration & Financial Rewards/Incentive payments.
Unit – V	Employees Fringe Benefits &Services - Safety, Health &Security programmer and welfare. Motivation and Moral.

(3) उत्पादन प्रबन्ध (प्रश्नपत्र : B –तृतीय)

PRODUCTION MANAGEMNT (Paper: B – Third)

M.M.:80

Unit – I	Fundamentals of production management, Nature, Scope, Functions; Problems, Production and Productivity organizing for production. Types of manufacturing systems.
Unit – II	Production planning, Objectives, Factors affecting Production Planning. Planning future activities, forecasting. Qualitative & Quantative forecasting Methods, longrange forecasts, project planning method (P.E.R.T. and C.P.M.) Process planning System. Techniques of process planning: Assembly charts, process charts make or buy analysis.
Unit – III	Process design, Factors affecting design Relation with types of manufacturing plant location and layout: Factors affecting location. Types of plans layout, evaluation of alternative layout.
Unit – IV	Work measurement and work standards Uses of work measurement date, procedure for work measurement. Direct work measurement. Time study, activity sampling, Indirect work measurement: Syntetic timing, Predetermined motion time system, analytical estimating. Methods analysis: Areas of application, Approaches to methods design, Tools for methods analysis, works implification programme.
Unit – V	**Production Control –** Control functions: Routing Londing, Scheduling, Despatching, Follow up. Quality control & inspection: place of quality control in modern enterpriss, organisation of qualit control. Statistical quality control, inspection location for inspection, inspection procedure and records, Inspection devices.

(4) व्यूह रचना प्रबन्ध (प्रश्नपत्र : B –चतुर्थ)

STRATEGIC MANAGEMENT (Paper: B – Fourth)

M.M.:80

Unit – I	**Concept of Strategy:** Defining strategy, levels at which strategy operates; Approaches to strategic decision making; Mission and purpose, objectives and goals; Strategic business unit (SBU); Functional level strategies. **Environmental Analysis and Diagnosis:** Concept of environment and its components; Environment scanning and appraisal; Organisational appraisal; Strategic advantage analysis and diagnosis, SWOT analysis.
Unit – II	**Strategy Formulation and Choice of Alternatives:** Strategies - modernisation, diversification, integration, Merger, take-over and jointstrategies; Turnaround, divestment and liquidation strategies; Process of strategic choice-industry, competitor and SWOT analysis; Factors affecting strategic choice; Generic competitve strategies- cost leadership, differentiation focus, value chain analysis, bench marking, service blue printing.
Unit – III	**Functional Strategies:** Marketing, production/ operations and R & D plans and policies. FunctionalStrategies: Personnel and financial plans and policies.
Unit – IV	**Strategy Implementation:** Inter-relationship between formulation and implementation; Issues in strategy implementation; Resource allocation. **Strategy and Structure:** Structural considerations, structures for strategies; Organisational design and change.
Unit – V	**Strategy Evaluation:** Overview of strategic evaluation; Strategic control; Techniques of strategic evaluation and control. Global Issues in Strategic Management.

विशिष्टिकरणः (C) बैंकिंग एवं बीमा

Specialization : (C) Banking and Insurance

(1) बैंकिंग व्यवहार – (प्रश्नपत्र : C –प्रथम)

BANKING PRACTICES (Paper: C – First)

M.M.: 80

OBJECTIVE–

This course enables the students to know the working of the Indian banking system and fundamentals of insurance.

Unit – I	Bank: Concept, Functions and Services, Prohibited Business, Nature of Banking, Qualities of Banker, Bank and Customer Relationship, Concept of Customer, general Relationship, Bankers, Rights and obligations, Termination of Relationship.
Unit – II	Accounts of Customers: Various Customers' Accounts, Opening an account, Nomination facility, Special Types of Customers Minors, Pardanashin Women, Lunatics, Intoxicated Persons, Joint Hindu Family, Limited Companies and Non Trading Concern.
Unit – III	Employment of Bank Funds, Importance of Liquidity, Cash Reserve, Money at call and short notice, Investments, Statutory provisions regarding liquid Assets, Principles of lending, Types of loan, Interest Tax Act.
Unit – IV	Purchase/Discounting of Bills, Legal Position, Bill Market scheme, Lodgment of bills, Vaghul Working Group Report, Letters of Credit, Concept and types, Crossing and endorsements of cheque.
Unit – V	Securities for Advances: General Principles, Advances against Goods, Stock Exchange Securities, Real Estate, Life Policies, Fixed Deposits, Gold, Silver, Bond and Debenture. Lien and Mortgage, Types of mortgage, Hypothecation, pledge.

(2) भारत में बैंकिंग संस्थाएँ –(प्रश्नपत्र : C – द्वितीय)

BANKING INSTITUTION IN INDIA (Paper: C – Second)

M.M. :80

Unit – I	**Indian Banking System:** Indigenous Bankers, Money Landers, Nationalization of commercial Bank and their Effects, Classification of Banking Institutions, Commercial Banks, Regional Rural Banks, Cooperative Banks.
Unit – II	**Development Banking in India:** IFCI, ICICI, SIDBI, Credit Guarantee Institutions; Export Credit Guarantee Corporation of India, Deposit Insurance and Credit Guarantee Corporation of India.
Unit – III	**R.B.I.:** Organization, function, Central Banking functions, Promotional functions, Control of credit by RBI, NBFC and RBI, Commercial Banks and RBI, Power of RBI.
Unit – IV	**Banking Regulation Act 1949:** Important features, Forms of Business of a Bank, Regulation for Capital, Control over Management, Restrictions on loans and advances winding up of a Banking Company, Amalgamation of Banks.
Unit – V	**Emerging trends in Banking Sector:** Narasimham Committee Report, Committee on Banking Sector Reforms, Bridge Loan and Privatization of Banks and its impact.

20/6/19 20/6/19 20/6/19

(3) जीवन बीमा–(प्रश्नपत्र :C –तृतीय)

LIFE INSURANCE (Paper: C – Third)

M.M. :80

Unit – I	**Life insurance:** introduction, History of life insurance, Utility, Object, Characteristics and importance of life insurance, procedure of getting life insurance, non – medical insurance, Insurance of sub – standard lives, insurance of female lives and Minors.
Unit – II	**Life insurance policy:** Conditions and kinds of Life insurance policies, some important plans of life insurance.
Unit – III	**Premium and Annuity:** Elements of premium; methods of premium computation, Natural premium plan, level premium plan, Gross and net premium, Loading mortality table – meaning, characteristics and importance in life insurance; Kinds of mortality table. Annuity: meaning, objects, advantages and kinds of annuity, annuity Vs Life insurance.
Unit – IV	Life Insurance agent and his working, settlements of Life insurance clamis. Guidelines and procedures, Organisation and management of life insurance corporation of India, working and progress.
Unit – V	Privatization of Life insurance in India, Insurance Regulatory & Development Authority Act, 1999,-powers and functions of authority.

(4) सामान्य बीमा –(प्रश्नपत्र : C –चतुर्थ)

GENERAL INSURANCE (Paper: C – Fourth)

M.M. :80

Unit – I	**Introduction:** Origin and Development of Insurance : Advantages, Importance and Functions of Insurance, Fundamental principles of Insurance – insurable interest, almost good faith, other principles – indemnity, subrogation, contribution, mitigating of loss warranties, Proximate cause etc.
Unit – II	**Classification and Re-insurance:** General Principles, various methods of re-insurance, under insurance, Over-insurance, double insurance Classification and organisation of Insurance.
Unit – III	**Marine Insurance:** Introduction, Evolution & Development of marine insurance. Necessary elements of marine insurance contract Peril & Scope of marine insurance. Procedure of Taking out Marine Insurance Policy, kinds of Marine insurance Policies, Computation of Marine Insurance Premiums and Returns, Marine Losses – Total loss, Actual and Constructive, Partial Loss – particular average loss and general average loss, Settlements of Claims and Recoveries, Salvage and Particular Charges.
Unit – IV	**Fire insurance:** Physical and moral haxards, functions of fire insurance, history of fire insurance ; principles of fire insurance, meaning of fire, characteristics of fire insurance, contract rights of insurer under a fire insurance contract, procedure of fire insurance policy, fire policy conditions, settlement of claims.
Unit – V	**Miscellaneous Insurance:** Personal accident Insurance, Motor, employer's liability fidelity guarantee, burglary, livestock, crop. And workmen's compensation insurance, Cattle Export Risks; Engineering; Aircraft insurance.

विशिष्टिकरण : (D) करारोपण एवं लेखांकन

Specialization: (D) Taxation and Accounting

(1) भारत में प्रत्यक्ष कर (प्रश्नपत्र : D – प्रथम)

DIRECT TAX IN INDIA (Paper: D – First)

M.M.:80

Unit – I	Basic Concepts and Definitions, Residential Status and Tax incidence. Exempted Income, Deemed Income, Clubbing of Income, Deductions under Section – 80.
Unit – II	Computation of Total Income and Tax Liabilities of Individual. Taxation on Agriculture Income.
Unit – III	Return of Income and Assessment, Various Types of Return, types of Assessment.
Unit – IV	Advance payment of Tax, Tax Deducted at Source, Penalties and Prosecution, Refund of Excess Payment.
Unit – V	Income Tax Authorities, Appeal and Revisions, Settlement of cases.

(2) अप्रत्यक्ष कर (प्रश्नपत्र : **D** –द्वितीय)

GOODS AND SERVICE TAX & CUSTOM LAW (Paper: D – Second)

M.M. :80

Unit – I	Introduction of GST, Necessity of GST, Major consequences of earlier Laws, Structure of GST (SGST, CGST, UTGST & IGST), GST counicl, GST, Network, State Compensation Mechanism, Registration Procedure.
Unit – II	Taxable event- "supply" of Goods and Services, Place of Supply, Within State, Import and Export , Time of Supply, valuation for GST, Valuation Rules, Exemption From GST, Small Supplies and Composition Scheme, Classification of Goods and Services Taxability of E-Commerce
Unit – III	Eligible & Ineligible input tax credit Apportionments of credit and blocked Credit, Tax Credit in respect of Capital Goods. Recovery of Excess Tax Credit: Availability of tax Credit in Special Circumstance: transfer of Input Credit (Input Service Distribution): Payment of Taxes: Refund.
Unit – IV	Nature of customs duty, Types of customs duties, valuation for customs, duty, inclusion and exclusion, valuation under customs act, Procedures for import and export under Custom Duty.
Unit – V	Export incentives, Duty drawback, Powers of customs officers, penalties, confiscation of goods.

(सेवा के क्षेत्र में लेखांकन (प्रश्नपत्र: D –तृतीय)

Accounting in Service Sector (Paper: D – Third)

M.M.:80

Unit – I	Accounts of Hotel Companies – Introductions, Sources of Income, Heads of Expenditures, Cash Book, Visitor's ledger, final accounts. Accounting for Transport Undertaking – Introduction – Railways, Trams and Buses, Roadways, Shipping. Preparation of Daily Log book and final accounts (Problems on roadways only)
Unit – II	Accounts for Hospitals – Introduction, preparation of final accounts, capital and revenue expenditure, OPD and IPD register. Accounts of Professional people.
Unit – III	Accounting for educational institutions – General cashbook, Collection Ledger, Donors Register, Stock book Register, Salary and wages Register, Types of Govt. Grants and its accounting, Annual statement of accounts.
Unit – IV	Accounts of Co-operative Societies – Accounts of Agricultural Farms.
Unit – V	Government Accounting: Basic principles of government Accounting, Commercial Accounting Vs Government Accounting, Consolidated funds contingency fund and public Accounts.

Optional Group – E

Paper –I: Business Environment

Objective

This course develops ability to understand and scan business environment analyse opportunities and take decisions under uncertainty.

Course Inputs

Theoretical Framework of Business Environment: Concept, significance and nature of Business Environment; Elements of Business Environment- internal and external; changing dimensions of Business Environment; Techniques of environmental scanning and monitoring.

Economic Environment of Business: Significance and elements of economic environment; Economic systems and business environment; Economic planning in India; Government policies-Industrial Policy, Fiscal, Monetary Policy, EXIM policy; Public Sector and Economic Development; Development Banks and relevance to Indian business; Economic reforms, Liberalisation and structural adjustment programmes.

Political and Legal Environment of Business: Critical elements of political environment; Government and business; changing dimensions of legal environment in India; MRTP Act, FEMA and Licensing policy; Consumer Protection Act.

Socio-Cultural Environment: Critical elements of socio-cultural environment; Social institutions and systems; Social values and attitudes; Social groups; Middle class; Dualism in Indian society and problems of uneven income distribution; Emerging rural sector in India; Indian business system; Social Responsibility of business; Consumerism in India.

International and Technological Environment; Multinational corporations; Foreign collaborations and Indian business; Non-resident Indian and corporate sector; International economic institutions – WTO' World Bank, IMF and their importance to India; Foreign trade policies; Impact of Rupee Devaluation; Technological environment in India; Policy on research and development; Patent Laws; Technology transfer.

References:

Adhikary, M: Economic Environment of Business, Sultan Chand & Sons, New, Delhi.

Ahluwalia, I.J: Industrial Growth in India, Oxford University Press, Delhi.

Alagh, Yoginder K: Indian Development Planning and Policy, Vikas Pub, N. Delhi

Aswathappa, K: Legal Environment of Business, Himalaya Publication, Delhi

Optional Group – E

Paper –II: Financial Institutions and Markets

Objective

This course aims at providing students with an understanding of the structure, organization, and working of financial markets and institutions in India.

Course Inputs

Introduction: Nature and role of financial system: Financial system and financial markets; Financial system and economic development; Indian financial system-an overview.

Financial Markets: Money and Capital Market: Money market –Meaning, constituents, functions of money market; Money Market Instruments- call money, treasury bills, certificate of deposits, commercial bills, trade bills etc; Recent trends in Indian money market; Capital market-Primary and Secondary market; Depository system; Government securities market; Role of SEBI- an overview; SEBI Guidelines, Recent development.

Development Banks: Concept, Objectives and functions of development banks: operational and promotional activities of development banks; IFCI, ICICI, IDBI, IRBI, SIDBI, State Development Banks, State Financial Corporations.

Unit Trust of India: Objective, function and various schemes of UTI; Role of UTI in industrial finance.

Mutual Funds: Concept, performance appraisal and regulation of Mutual Funds (with special reference to SEBI guidelines); Designing and marketing of mutual funds schemes; Latest mutual fund schemes in India-an overview.

Insurance Sector: Objectives, role, investment practices of LIC and GIC: Insurance Regulatory and Development Authority-Role and Functions.

Non-Banking Financial Institutions: Concept and role of Non-Banking Financial Institution; Sources of finance; Functions of Non-Banking Financial Institution; Investment policies of Non-Banking Financial Institutions in India.

Merchant Banking: Concept, functions and growth; Government policy on Merchant Banking Services; (SEBI guidelines) Future of Merchant Banking in India.

Foreign Investments: Types, trends and implications; Regulatory framework for Foreign Investments in India.

Reference:

Avdhani: Investment and Securities Markets in India, Himalayas Publications, Delhi.

Bhole, L.M. Financial Markets and Institutions, Tata McGraw Hill, Delhi.

Ghosh, D: Banking Policy in India, Allied Publications, Delhi.

Giddy, I.H. Global Financial Markets, A.I.T.B.S. Delhi.

Khan, M.Y: Indian Financial System, Tata McGraw Hill, Delhi.

Reserve Bank of India, Various Reports, RBI Publication, Mumbai.

Varshney, P.N.; Indian Financial System, Sultan Chand & Sons. New Delhi.

Averbach, Robert D: Money, Banking and Financial Markets; MacMillan, London.

Srivastava R.M; Management of India Financial Institution: Himalaya Publishing House, Mumbai.

Verma JC. Guide to Mutual Funds and Investment Portfolio, Bharat Publishing House, New Delhi.

Optional Group – E

Paper –III: Research Methodology

Objective

This course aims at providing students with an understanding of the Research Methodology.

Course Inputs

Research Methodology: An Introduction, Meaning of Research, objective, nature, scope and significance of Research, Research process, criteria of good Research, Research approaches, types of Research, stages in the development of Research (steps of research), methods of Research.

Scientific Method of Research: Meaning and definition of Scientific research, Characteristics of scientific method, basic (elements) or steps in scientific method, limitation of scientific method.

Nature and Role of Hypothesis in Commerce Research- Meaning, definition of Hypothesis, characteristics of hypothesis, formation of hypothesis, function of hypothesis, dimensions of hypothesis, Sources of hypothesis, development of hypothesis, importance of hypothesis in commerce, types of hypothesis, testing of hypothesis, essential elements of a good hypothesis, difficulties in formation of hypothesis.

Deduction and Induction Methods- Meaning and definition of deduction method, merits and demerits of deduction method, meaning and definition of induction method, merits and demerits of induction method, distinguish between deduction and induction method.

Research Design: Meaning and Definition of Research Design, Characteristics of research design, subject matter of research design, steps of research design, and objectives of research design, types of research design, Exploratory research design, descriptive research design, experimental research design.

Research Problem Selection and Identification- Meaning and definition of problem, sources of problem, characteristics of problem-of research Identification and interpretation of problem, the situation analysis and determination of field. How to select a problem area, 7(seven)-Guiding Principles in the choice of a topic.

Planning and Organizing the Research Report: -Meaning and definition of data, Collection of data, Importance of data collection, types of data sources, features, importance and limitation of data, techniques of data collection-Questionnaire, Interview Schedule.

Sampling: Meaning, definition of sampling, characteristics of sampling, essential concepts of sampling, planning of sampling, characteristics of a good sampling, types of sampling, merits and demerits of sampling, problem of sampling and their solutions.

Scaling Techniques: Meaning and need of scaling, some general problem of scaling & characteristics of a good scaling, measurement in social sciences, function of measurement Processing the data-Editing, Coding, Tabulation.

Analysis, Interpretation, Presentation- Meaning, definition of analysis, procedure of analysis, basic of analysis, variables of analysis, major types of analysis, Interpretation and Presentation of data-Meaning, technique of interpretation and presentation, precaution of interpretation and presentation.

Research Report Writing: Meaning and definition, different steps in writing report, layout of the research report, types of report, general principles of preparation of report, structure of report, language and style of report, publication of report, precaution for writing research reports.

Reference

C.R. Kothari: Research Methodology- Methods and Techniques: New age International Publishers

Kumar Ranjeet: Research Methodology

Panneerselvam R: Research Methodology

शोध प्रविधिः बी. एल. फाड़िया

शोध प्रविधिः कुलश्रेष्ठ

Optional Group – E

Paper –IV: Security Analysis

Objective

The Objective of the course is to help students understand various issues in Security Analysis.

Course Inputs

Investments: Nature and Scope of Investment Analysis, Elements of Investment, Avenues of Investment, Approaches to Investment Analysis; Concept of Return and risk; Security Return and Risk Analysis, Measurement of return and risk.

Financial Assets: Types and their characteristics; sources of financial information.

Security Markets: Primary and Secondary Market: Primary Market- role, Functions and methods of selling securities in Primary Market; Allotment procedure; New Financial Instruments.

Secondary market: Role, Importance, type of Brokers, trading mechanism, Listing of Securities in Stock Exchanges, screen based trading: Depository- role and need: Depositories Act, 1996.

Public Issue: SEBI guidelines on Public Issue, size of issue, pricing of issue, Promoters Contribution, appointment of merchant bankers, underwriters, broker, registrar and managers, Bankers and Allotment of shares.

Valuation of Securities: Bonds, Debentures, Preference Shares, Equity Shares.

Fundamental Analysis: Economic Analysis, Industry Analysis and Company Analysis.

Technical Analysis: Trends, Indicators, Indices and Moving Averages applied in Technical Analysis.

Reference:

Amling: Fundamentals of Investment Analysis, Prentice Hall, International Edition.

Bhalla; Investment Analysis, S. Chand & Co. Delhi.

Chandratre, K.R: Capital issue, SEBI & Listing, Bharat Publishing House , New Delhi.

Clark, James Fransis: Investment Analysis and Mangement, McGraw Hill, International Edition.

Donal, E.Fisher and Ronald J. Jorden: Security Analysis andportfolio Management, Prentice Hall, New Delhi

Fabozzi, Frank J: Investment Management, Prentice Hall, International Edition

Gupta, L.C: Stock Exchange Trading in India; Society for Capital Market

Research and development, Delhi.

Machi Raju, H.R: Merchent Banking: Wiley Eastem Ltd, New Delhi.

Machi Raju, H.R: Working of Stock Exchange in India; Wiley Eastem Ltd, New Delhi.

Sharpre, William F, Gordon J Alexander and J.V Bailly: Investments, Prentice Hall of India, New Delhi.

Shapre, William F: Portiolio Theory and Capital Market; McGraw Hill, New York.

Francis J. Clark: Management of Investments; McGraw Hill, New York.

HEMCHANDYADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.Sc. (Physics) Semester Exam

UNDER

FACULTY OF SCIENCE

Session 2019-20

(Approved by Board of Studies)
Effective from June 2019

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Syllabus for M.Sc. Physics (Semester System)

Semester – I (2019-2020)

Paper – I : Mathematical Physics
Paper – II : Classical Mechanics
Paper – III : Electrodynamics & Plasma Physics
Paper – IV : Electronics
Laboratory Course I-A : General & Optics
Laboratory Course I-B : Electronics

Semester – II (2019-2020)

Paper – I : Quantum Mechanics - I
Paper – II : Statistical Mechanics
Paper – III : Electronic & Photonic Devices and Optical Modulators
Paper – IV : Computational Methods & Programming
Laboratory Course I-A : Numerical Analysis & Computer Programming
Laboratory Course I-B : Digital Electronics &Microprocessor

Semester – III (2019-2020)

Paper – I : Quantum Mechanics - II
Paper – II : Atomic & Molecular Physics
Paper – III : Solid State Physics - I
Paper – IV : (A) Astronomy & Astrophysics - I
(B) Electronics (Communication) - I
(C) Physics of Nano-material - I
(D) Space Physics - I
Laboratory Course III-A : Material Science & General
Laboratory Course III-B : Astronomy & Astrophysics **OR**
Electronics (Communication **OR**
Physics of Nano-material **OR**
Space Physics

Semester – IV (2019-2020)

Paper – I	: Nuclear & Particle Physics
Paper – II	: Laser Physics and Applications
Paper – III	: Solid State Physics - II
Paper – IV	: (A) Astronomy & Astrophysics - II
	(B) Electronics (Communication) - II
	(C) Physics of Nano-material - II
	(D) Space Physics - II

Project Work

The Syllabus for M.Sc. Physics (Semester System) is hereby approved by the members of the Board of Studies.

M. Sc. - PHYSICS

M.Sc. in Physics is a full time 2-year (4-semesters course). There will be four theory papers, and two laboratory courses/project in each semester. In each semester, there will be two internal examinations/assessments. Semester-wise course structure along with distribution of marks is given below:

Semester I

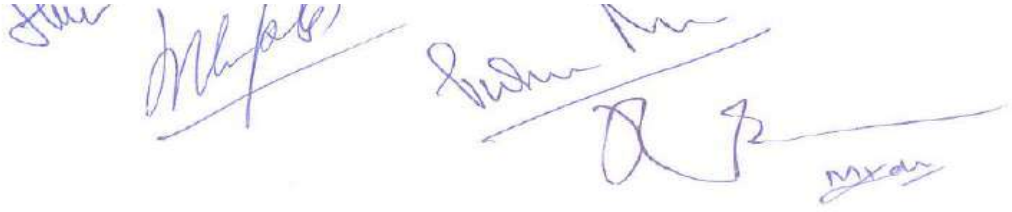
Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Mathematical Physics	80	16	20	04	100	4
2. Classical Mechanics	80	16	20	04	100	4
3. Electrodynamics & Plasma Physics	80	16	20	04	100	4
4. Electronics	80	16	20	04	100	4
A : General & Optics	-		-		100	2
Laboratory Course I-B : Electronics	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester I = 600 & Credit = 20

Semester II

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Quantum Mechanics-I	80	16	20	04	100	4
2. Statistical Mechanics	80	16	20	04	100	4
3. Electronic & Photonic Devices and Optical Modulators	80	16	20	04	100	4
4. Computational Methods & Programming	80	16	20	04	100	4
Laboratory Course II-A : Numerical Analysis & Computer Programming	-		-		100	2
Laboratory Course II-B : Digital Electronics & Microprocessor	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester II = 600 & Credit = 2



Semester III

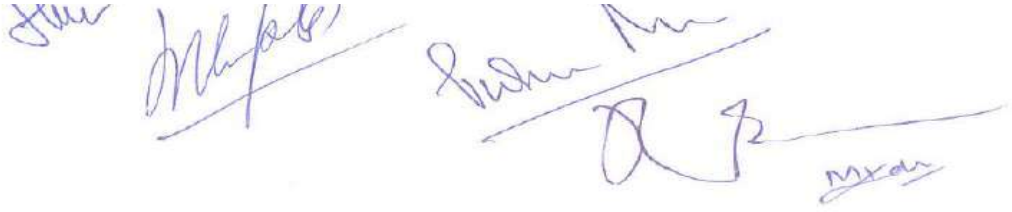
Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Quantum Mechanics-II	80	16	20	04	100	4
2. Atomic & Molecular Physics	80	16	20	04	100	4
3. Solid State Physics-I	80	16	20	04	100	4
4. (A) Astronomy & Astrophysics-I (B) Electronics (Communication)-I (C) Physics of Nano-material-I (D) Space Physics-I	80	16	20	04	100	4
Laboratory Course III-A Materials Science & General	-		-		100	2
Laboratory Course III-B : Astronomy & Astrophysics **OR** : Electronics (Communication) **OR** : Physics of Nano-material **OR** : Space Physics	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester III = 600 & Credit = 20

Semester IV

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Nuclear & Particle Physics	80	16	20	04	100	4
2. Laser Physics and Applications	80	16	20	04	100	4
3. Solid State Physics -II	80	16	20	04	100	4
4. (A) Astronomy &Astrophysics-II (B) Electronics(Communication)-II (C) Physics of Nano-material-II (D) Space Physics-II	80	16	20	04	100	4
Project Work	-		-		200	4
Total Marks					**600**	**20**

Total Marks for Semester IV = 600 & Credit = 20



In Each Semester

MAXIMUM MARKS TOTAL	PASS PER TH.	PR.
600	**36**	**36**

In semester IV, Project work in Solid State Physics/ Astronomy & Astrophysics/ Electronics/ Physics of Nano-materials/ Space Physics will lead to specialization in the respective area. It will be primarily based on research oriented topics. On completion of the project, student will submit project report in the form of dissertation which will be examined by an external examiner. The examination of project work shall consist of (a) Presentation and (b) comprehensive viva-voce.

Marks-distribution for Laboratory Courses and Project Work:

(a) Laboratory courses (Semesters I-III):

Sessional	: 20Marks
Viva	: 20Marks
Experiment	: 60Marks

(b) Project Work (Semester IV):

Report–Dissertation	: 60 Marks
Presentation	: 100 Marks
Comprehensive viva-voce	: 20 Marks
Internal assessment	: 20 Marks

Note: Paper IV of both Semesters III and IV is a major elective course. Student has to opt for any one of the courses: (A) or (B) or (C) or (D). The commencement of any one of the major elective paper is subjected to the availability of basic infrastructural facilities viz. expert faculty, laboratory etc.

Detailed Course Content

Semester – I

(2019-2020)

PAPER-I: MATHEMATICAL PHYSICS

Unit-I: Vector space and Matrices, Linear independence, Bases, dimensionality, Inner product, Linear transformation, matrices, Inverse, Orthogonal and Unitary matrices, Independent element of a matrix, Eigen values and Eigen Vectors, Diagonalization, Complete orthonormal sets of functions.

Unit-II: Complex Variables: Cauchy- Riemann condition, analytic functions, Cauchy's theorem, Cauchy integral formula, Laurent series, singularities, residue theorem, contour integration, evaluation of definite integrals, problems.

Unit-III: Differential equations, first order differential equation, second order differential equation with constant coefficients, second order linear ODEs with variable coefficients, Solution by series expansion, nonhomogeneous differential equations and solution by the method of Green's functions.

Unit-IV: Special functions, Legendre, Bessel, Hermite and Laguerre functions with their physical applications, generating functions, orthogonality conditions, recursion relations,

Unit-V: Integral transforms, Fourier integral and transforms, inversion theorem, Fourier transform of derivatives, convolution theorem, Laplace Transform(LT), LT of Derivatives, Inverse LT, Fourier series; properties and applications, discrete Fourier transform.

TEXT AND REFERENCE BOOKS

1. Mathematical Methods for Physics, by G. Arfken.
2. Matrices and Tensors for Physicist, by A. W. Joshi.
3. Advanced Engineering Mathematics, by E. Kroyazig.
4. Special Functions, by E. B.Rainville.
5. Special Functions, by W.W.Bell.
6. Mathematical Method for Physicist and Engineers, by K. F. Relly, M. P. Hobson and S. J.Bence
7. Mathematics for Physicists, By Marry L.Boas.

Paper - II: CLASSICAL MECHANICS

Unit-I Preliminaries, Newtonian mechanics of one and many particle systems, Conservation laws, Constraints & their classification, Principle of virtual work, Generalized coordinates, D'Alembert's principle and Lagrange's equations, Velocity-dependent potentials and dissipation function, Simple applications of the Lagrangian formulation, Hamilton's principle, Lagrange's equations from Hamilton's principle, Conservation theorems and Symmetry properties, Energy function and the conservation of energy.

Unit-II The Hamiltonian formulation of mechanics, Legendre transformations and the Hamilton's equations of motion, Cyclic coordinates and Conservation Theorems, Hamilton's equations from Hamilton's principle, The principle of least action, Simple applications of the Hamiltonian formulation.

Unit-III Canonical transformations with examples, The harmonic oscillator, Poisson's brackets, Equations of motion and conservation theorems in the Poisson Bracket formulation. Hamilton-Jacobi (HJ) theory: The HJ equation for Hamilton's principal function, Harmonic oscillator as an example of the HJ method, The HJ equation for Hamilton's characteristic function, The action-angle variables

Unit –IV The Central force: Two-body central force problem and its reduction to the equivalent one-body problem, The equations of motion and first integrals, The equivalent one-dimensional problem and classification of orbits, The differential equation of the orbit, Closure and stability of orbits, The Kepler problem, Scattering in a central force field: Rutherford scattering.

Unit – V Rigid body dynamics, The Euler angles, Euler's theorem on the motion of a rigid body, Rate of change of a vector, The Coriolis force, Angular momentum and Kinetic energy of motion about a point, The Euler equations of motion of rigid bodies. Formulation of the problem of small oscillations, The Eigen-value equation and the principal axis transformation, Frequencies of free vibration and normal coordinates, Free vibration of linear triatomic molecule.

TEXT AND REFERENCE BOOKS

1. Classical Mechanics, By N.C. Rana and P.S. Joag (Tata McGraw-Hill,1991)
2. Classical Mechanics, by H.Goldstein (Addison Wesley,1980)
3. Classical Mechanics, by H.Goldstein, C Poole & J Fafko (PearsonEducation, Inc,2002)
4. Mechanics, by A.Sommerfeld, (Academic press,1952)
5. Introduction to Dynamics by Perceival and D.Richaeds(Cambridgeniversity, press ,1982).

Paper-III: ELECTRODYNAMICS & PLASMA PHYSICS

Unit-I Maxwell's equations, vector and scalar potentials and the wave equation, Gauge transformations, Lorenz gauge, Coulomb gauge, Green function for the wave equation, four-vectors, mathematical properties of the space-time in special relativity, matrix representation of Lorentz transformation, covariance of electrodynamics, transformation of electromagnetic fields.

Unit-II Radiation by moving charges, Lienard-Wiechert potential and fields for a point charge, total power radiated by an accelerated charge- Larmor's formula and its relativistic generalization, angular distribution of radiation emitted by an accelerated charge, radiation emitted by a charge in arbitrary extremely relativistic motion, distribution in frequency and angle of energy radiated by accelerated charge.

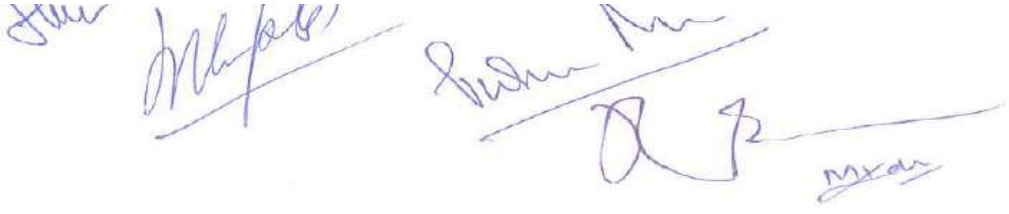
Unit -III Bremsstralung: emission from single-speed electrons, thermal Bremsstralung emission and absorption, Synchrotron radiation: spectrum of synchrotron radiation, spectral index for power law electron distribution, transition from Cyclotron to Synchrotron emission, Cherenkov radiation

Unit-IV Plasma: definition, Debye shielding phenomenon and criteria for plasma, motion of charged particles in electromagnetic field; Uniform E & B fields, Electric field drift, Non-uniform magneto static field, Gradient B drift, Parallel acceleration and magnetic mirror effect, Curvature drift, adiabatic in variants.

Unit-V Elementary concepts of plasma kinetic theory, the Boltzmann equation, the basic plasma phenomena, plasma oscillations. Fundamental equations of magneto- hydrodynamics (MHD), Hydrodynamics Waves; Magneto sonic and Alfven waves, Magnetic viscosity and magnetic pressure, plasma confinement schemes.

REFERENCE BOOK:

1. Jackson, classical electrodynamics.
2 Rybicki & Lightman: Radiative Processess in Astrophysics
2 Panofsky and Phillips: Classical electricity and magnetism.
3 Bittencourt, Plasma physics.
4 Chen: Plasma physics.



Paper - IV: ELECTRONICS

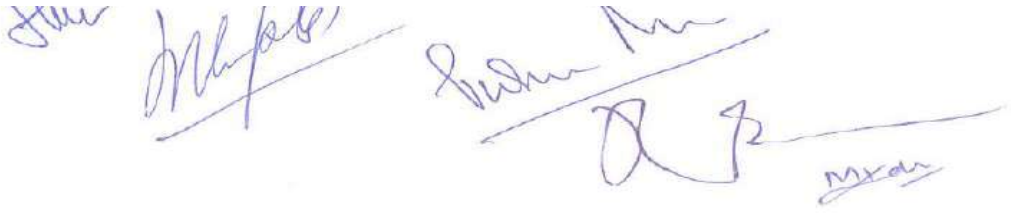
Unit-I Operational Amplifier- Basic Op. Amp. Differential amplifier, the emitter coupled Difference Ampl, Transfer characteristics of a Diff. Ampl., an example of an IC Op.-Amp., off set error voltage and currents, measurement of Op.-Amp. Parameters, frequency response of Op-amp. Linear analog systems: Basic Op.-Amp. Applications, Analog integration and differentiation, Electronic analog computation, Non-linear analog systems: Comparators, Wave form generators.

Unit-II Combinational Logic –Basic logic gates: OR, AND and NOT gates, NOR and NAND gates, Boolean algebra, DeMorgan's theorems, exclusive OR gate, characteristics of logic families, saturated logic families: RTL, DCTL, non-saturated logic families: TTL and ECL, Unipolar logic families.

Unit -III Sequential Logic, Flip-flops: RS Flip-flop, level clocking, Edge triggered Flip Flops, D Flip flops. JK Flip-flops, J.K. master slave Flip-flops, Registers: buffer, shift and control shift registers, counters: ripple synchronous & ring counters, tri - state registers, Buffer: controlled buffer Register, Bus organized structure, Latch, multiplexer, De multiplexer, decoder, ALU Memories: RAM, ROM, PROM, EPROM, A/D and D/A converters.

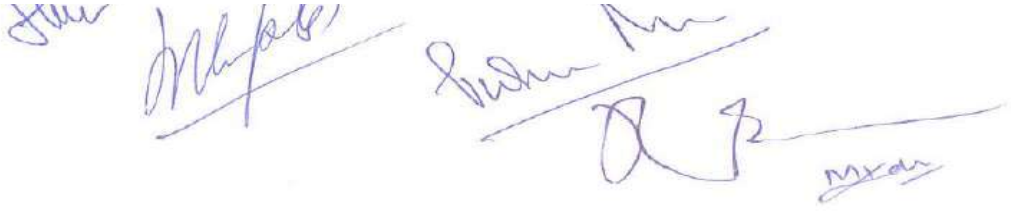
Unit-IV Microprocessors – Building concept of microprocessors, developing inside of microprocessor , Instruction codes ,Instruction Register ,Introducing RESET Pin, Introducing on chip oscillator, Interfacing I/O devices, Introducing Interrupt lines :Stack, Push, Pop operation ,delay in servicing interrupts, multiply interrupts, location for interrupts .Introducing slow and fast data transfer, Status of microprocessor, interrupt pins, General purpose Register, flag Register, Increment/decrement register. Features of 8085 microprossor. Pin diagram of 8085, block diagram of 8085. CPU of a microprocessor, timing and control, system timings and interrupt timings of 8085, registers in 8085, interfacing memory and I/O devices- a preliminary ideas. Number system, Floating Point notation.

Unit - V Instructions set of 8085, types of instructions- Data transfer group, Arithmetic logic, branch group, stack I/O machine control group, addressing mode of Intel 8085, examples of Assembly language programs of 8085, summing of two 8-bit numbers to result a 16-bit number, summing two 16-bit number, multiplying two 8-bit number to result a 16-bit product, block transfer of data from one memory block to other, BCD to hexadecimal data, finding the largest number in a series.



Text and reference books:

1. Integrated Electronics: J.Millman R.C.C. Halkias.
2. Electronics devices and circuit theory, by Robert Boylested and Louis Nashdaky PHI, New Delhi-110001,1991.
3. Operational amplifier linear integrated circuits, by Romakanth A. GayakwadPHI, second edition1991.
4. Digital computer electronics- An introduction tomicrocomputers-A.P.Malvino.
5. Digital finances and applications, by A.P. Malvino and Donald P.Leach,Tata McGraw Hill company, New Delhi 1993.
6. Microprocessor architecture, programming applications with 8085/8086 by Ramesh S.Gaonkar, Willey-Eastern limited1987.
7. Introduction to microprocessors – A.P.Mathur (TataMcGraw).
8. Microprocessors-Theory and applications- M.Hafiquizzaman (Prenticehall).
9. Microprocessors fundamentals- SchanmiOutling Service AuthorPocerL.Tokheim.
10. Integrated circuits : K KBotkar(Khannapublications)
11. Digital Electronics : R P Jain (Tata McGrawHill)
12. Microprocesss : BRam
13. 8-bit microprocessor : V.J.Vibhute& P.B. Borole(Tecn-Max Publication,Pune)



Laboratory Course

Lab I-A: General & Optics (Any ten)

1. Determination of band gap of semiconductor by four probmethod.
2. Measurement of Hall Coefficient of given semiconductor: identification of type of semiconductor and estimation of charge carrierc on centration.
3. Determination of wavelength of mercury light by constant deviation spectrometer using Hartmann formula.
4. Ultrasonic velocity in a liquid as a function of temperature using ultrasonic interferometer.
5. Experiment on transmission line (A) Determination of characteristics impedance, (B) Study of voltage distribution.
6. Determination of the Curie temperature of ferromagnetic material.
7. Determination of forbidden gap of a diode by plotting reverse saturation current as a function of temperature.
8. Determination of operating voltage and study the characteristics of a G Mtube.
9. Determination of operating voltage of a GM tube and determine the linear absorption coefficient.
10. Determination of operating voltage of a GM tube and verify inverse-square law.
11. Determination of short half-life of a given source which can be obtained from a mini generator or produced with a neutron source by activation.
12. X-ray diffraction by Telexometer.
13. Determination of ionization potential of Lithium/Mercury.
14. Determination of e/m of electron by Normal Zeeman Effect using Febry-Perot Etalon.
15. Determination of Dissociation energy of iodine (I_2) Molecule by photography, the absorption bands of I_2 in the visible region.
16. Measurement of wavelength of He-Ne Laser light using a ruler and thickness of thin wire by the laser.
17. To study Faraday Effect using He-Ne Laser.

Lab I-B: Electronics (Any ten)

1. Design & Study of Regulated Power supply.
2. Study of Transistor Amplifiers in CE, CB, and CC modes.
3. Study of Transistor Bias Stability.
4. Study of Astable, Monostable and Bistable Multivibrator.
5. Study of Silicon Controlled Rectifier.
6. Experiment of Uni – Junction Transistor and its application.
7. Experiment of FET and MOSFET characterization and application as an amplifier.
8. Study of Differential. Amplifier.
9. Basic Logic gates and verification of their Truth-Tables.
10. Combinational logic gates and verification of De-Morgan's Theorem.
11. Study of Basic Operational Amplifier(741).
12. Study of Opto- Electronics Devices.

Semester – II

(2019-2020)

PAPER - I: QUANTUM MECHANICS-I

Unit - I Inadequacy of classical mechanics, Planck's quantum hypothesis and radiation law, Photoelectric effect, De-Broglie's theory. Schrödinger equation, continuity equation, Ehrenfest theorem, admissible wave functions, stationary states, one-dimensional problems; potential well and barriers, Schrödinger equation for harmonic oscillator and its solution, uncertainty relations, states with minimum un certainty product.

Unit –II Superposition principle, general formalism of wave mechanics, representation of states and dynamical variables, commutation relationship, completeness and normalization of Eigen functions, Dirac-delta function, Bra & Ket notation, matrix representation of an operator, harmonic oscillator and its solution by matrix method, Heisenberg equation of motion.

Unit -III Angular momentum in quantum mechanics, commutation relationships, Eigen values, Spin angular momentum, Pauli`s matrices, addition of angular momentum, Clebsch-Gordon coefficients.

Unit – IV Central force problem, spherically symmetric potentials in three dimensions, separation of wave equation, parity, three-dimensional square-well potential and energy levels, the hydrogen atom; solution of the radial equation, energy levels and stationery state wave functions, discussion of bound states, degeneracy.

Unit –V Time- independent perturbation theory, non-degenerate case, first order and second perturbations with the example of an oscillator, degenerate cases, removal of degeneracy in second order, Zeeman effect without electron spin, first-order Stark effect in hydrogen, perturbed energy levels, correct Eigen function, occurrence of permanent electric dipole moments.

TEXT AND REFERENCE BOOKS:

1. L.I. Schiff: quantum mechanics (McGraw-Hill).
2. S. Gasiorowicz, Quantum Physics(Wiley).
3. Landau and Lifshitz : Non-relativistic quantum mechanics.
4. B.Craseman and Z.D.Powell: quantum mechanics (Addison Wesley)
5. A.P. Messiah: Quantum Mechanics.
6. J.J. Sakurai : Modern Quantum Mechanics.
7. Mathews and Venkatesan : Quantum Mechanics.

PAPER – II: STATISTICAL MECHANICS

Unit-I Foundation of statistical mechanics: macroscopic and microscopic states, contact between statistical and thermo dynamical quantities, physical significance of Ω(N, V, E), the classical gas, entropy of mixing and Gibb's paradox, phase space of classical system, Liouville`s theorem and its consequences, quantum states and phase space.

Unit- II Elements of ensemble theory – A system in micro canonical, canonical, and grand canonical ensembles, partition functions, physical significance of statistical quantities, example of classical system, energy and energy-density fluctuations and mutual correspondence of various ensembles.

Unit -III Formulation of quantum statistics – Quantum mechanical ensemble theory, density matrix, statistics of various quantum mechanical ensembles, system composed of indistinguishable particles.
Theory of simple gases –Ideal gas in various quantum mechanical ensemble, Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac distributions, statistics of occupation number.

Unit - IV Ideal Bose and Fermi gases -Thermodynamic behavior of an ideal Bose gas, Bose-Einstein condensation and, elementary excitations in liquid helium II, Thermodynamic behavior of an ideal Fermi gas, the electron gas, nonrelativistic and relativistic degenerate electron gas, theory of white dwarf stars.

Unit -V Statistical Mechanics of interacting systems – the method of cluster expansion for a classical gas, Virial expansion of the equation of state. Theory of phase transition – general remark on the problem of condensation, Fluctuations: thermodynamic fluctuations, Spatial correlation in a fluid Brownian motion: Einstein Smoluchowski theory of Brownianmotion.

TEXT & REFERENCE BOOKS –

1. R. K. Pathria, Statistical Mechanics (PergamonPress).
2. L. D. Landau & E. M. Lifshitz (Butter worth and HeinemannPress).
3. FederickReif, Fundamental of statistical and thermal physics (McGraw-Hill publishers).
4. Kerson Huang, Statistical Mechanics (WileyEastern).

PAPER –III: ELECTRONIC & PHOTONIC DEVICES AND OPTICAL MODULATORS

Unit– I Special Bipolar devices: Thyristors- the four-layer diodes and their basic characteristics, Schottky diode, three terminal thyristor, Diac &Triac, SCR, UJT, Field controlled Thyristors.

Unit- II Unipotar Devices : JFET, MESFET and MOSFET, basic structure, working and device I-V characteristics, small signal equivalent circuit for Microwave performance Introduction to MIS and MOS diodes, charge coupled devices (CCDs), basic structure and working principle , MOSFET-basic device characteristics, types of MOSFET.

Unit-III Special Microwave Devices: Tunnel diode and backward diode- basic device characteristics, IMPATT diodes and their static and dynamic characteristics, Transfer electron devices- transferred electron effect, Gunn diodes.

Unit-IV Photonic Devices: Radiative transitions, LEDs, Visible and infrared SC lasers; Photo detectors; Photo conductor, & Photodiode, Solar cells, Solar radiation and ideal conversion efficiency, p-n junction solar cells, Hetero junction. Interface thin film solar cells.

Unit -V Optical Modulators and Display Devices: Modulation of light- Birefringence, Optical activity, Electro-optic, Magneto-optic and Acoustic- optic effects, Materials exhibiting these properties, Non-linear optics. Display devices: Luminescence, Photo-luminescence, Electro-luminescence, Liquid crystal displays, Numeric displays.

TEXT & REFERENCE BOOKS-

1. Semiconductor Devices – Physics and Technology, by S M Sze,Wiley(1985)
2. Introduction to semiconductor device, M.S. Tyasi, John Wiley andsons
3. Measurement, Instrumentation and experimental design in physics and engineering by M.Sayer and A.Mansingh, Prentice Hall India2000
4. Optical electronics by Ajay Ghatak and K.Thyagarajah, Cam.Univ.Press.
5. Opto electronics – An introduction: J.Wilson and JFB Hawkes (Eastern Economy Edition).
6. Optical Communications: J.H. Franz and V.K. Jain(Narosa).

PAPER – IV: COMPUTATIONAL METHODS AND PROGRAMMING

Unit–I Methods for determination of zeroes of linear and nonlinear algebraic equations and transcendental equations, convergence of solutions. Solution of simultaneous linear equations, Gaussian elimination, pivoting, iterative method, matrix inversion.

Unit –II Finite differences, interpolation with equally spaced and unevenly spaced points, curve fitting, polynomial least squares and cubic spline fitting. Numerical differentiation and integration, Newton-Cotes formulae, error estimates, Gauss method.

Unit –III Numerical solution of ordinary differential equations, Euler and Runge-Kutta methods, predictor-corrector method, elementary ideas of solutions of partial differential equations.

Unit- IV Elementary information about digital computer principles, compilers, interpreters and operating systems (Windows/Linux) Fortran programming, flow charts, integers and floating point arithmetic, expressions, built in functions.

Unit-V Executable and non-executable statements, assignments, control and input-output statements, subroutines and functions; The statement functions, main features of functions and subroutines, subprogram, function subprogram, overall structure of FORTRAN program, external statement, subroutine subprogram, common statement, equivalence statement, operations with files-open and close statement, Format statements, field specifications.

TEXT AND REFERENCE BOOKS

1. Sastr: Introductory Methods of NumericalAnalysis.
2. Rajaraman: NumericalAnalysis.
3. Antia: Numericalmethods.
4. Raja Raman: FORTRANprogramming.

Laboratory Course

Lab II-A: Numerical Analysis & Computer Programming (Any ten)

1. To solve simultaneous Linear equation by Gauss Elimination method.
2. To calculate the root of a transcendental equation by Newton – Raphsons method.
3. Solving the system of linear simultaneous equation by Gauss Serdel method.
4. Numerical Integration by Simpson's 1/3Rule.
5. Solving simultaneous Linear equation by Gauss-Jordon method.
6. Solution of Differential equation by Euler's Method.
7. To invert a given matrix by Gauss-Jordon Method.
8. Solution of Differential equation by Runga Kutte Method.
9. To fit the given data in a straight line by linear regression Method.
   a) WAP to find the Largest of n number of series.
   b) To calculate the standard deviation of a given set of data.
10. To write a program to compute the complex roots of a given polynomial of N^{th}degree by Grafffe's Method.
11. To write a program to compute the Eigen values of a given matrix.
12. To integrate a given function by: (a) Trapezoidal method or by (b) Gauss Quadrature.
13. To find solutions of Ist order, ordinary differential equation by Taylor method

Lab II-B: Digital Electronics & Microprocessor (Any ten)

1. Study of R-S, D/T, J-KFlip-Flops.
2. Study of counters: Ripple, Mode 3, Mode 5counters.
3. Study of ShiftRegister.
4. Study of R-2R D/AConverter.
5. Study of Random Access Memory (RAM) Read Only Memory.(ROM)
6. Study of A/DConverter.
7. Experiment with Microprocessor:-I
   (a) Convert BCD in toHEXADECIMPL
   (b) To transfer group of date blocks from one location to anotherlocation.
8. Experiment with microprocessor: -II
   (a) To write programs for addition of two 1 byte data giving results of 2bytes.
   (b) To write programs for multiplication of two 1 byte data giving results of 2bytes.
9. (a) To add 2 16-BIT numbers stored in locations from x xxx to x xxx + 3 andadd them store the results from x xxx + 4 to x xx x+6 memorylocation
   (b) To find the largest of n numbers of aseries.
10. To arrange N numbers in an ascendingorders.
11. Experiments withMicroprocessor.
    (a) Convert BCD in to binary andvice-versa.
    (b) To transfer group of data blocks from one location to anotherlocation.
    (c) To write programs for addition of two 1byte data giving result of 2bytedata
    (d) To write programs for multiplication of two 1 byte data giving result of 2bytedata.
12. Logic gate study DTL andRTL.
13. Study ofadder/Subractor.

Semester – III

(2019-2020)

PAPER –I: QUANTUM MECHANICS -II

Unit-I Variational method, expectation value of energy, application to excited states, ground state of He-atom, Zero point energy of one dimensional harmonic oscillator, Vander-waals interaction, the W.K.B. approximation, approximate solutions, asymptotic nature of the solution, solution near turning point, connection formulae, energy levels of a potential well and quantization rule.

Unit-II Theory of scattering: differential and total scattering cross section, wave mechanical picture of scattering & the scattering amplitude, Green's functions and formal expression for scattering amplitude, The Born approximation and its validity, Partial wave analysis, asymptomatic behavior of partial waves and phase shifts, optical theorem, scattering by a square well potential, scattering by a hard sphere, scattering by a Coulomb potential.

Unit - III Time-dependent perturbation theory, first order perturbation, Harmonic perturbation, Fermi`s Golden rule, Ionization of a H-atom, absorption and induced emission, Selection rules. Identical particles, symmetric and anti-symmetric wave functions

Unit - IV Relativistic quantum mechanics, formulation of relativistic quantum theory, the Klein-Gordon equation; plane wave solutions, charge and current densities, The Dirac equation for a free particle, matrices alpha and beta, Lorentz covariance of the Dirac equation, free particle solutions and the energy spectrum, charge and current densities.

Unit-V The spin of the Dirac particle, Dirac particle in electromagnetic fields and the significance of the negative energy state, Dirac equation for a central field: Spin angular momentum, approximate reduction, spin –orbit energy, separation of equation, the hydrogen atom, classification of energy levels and negative energy states.

TEXT AND REFERENCE BOOKS –

1. L.I. Schiff: Quantum Mechanics(McGraw-Hill).
2. S.Gasiorowicz: Quantum Physics(Wiley).
3. Landau and Lifshitz : QuantumMechanics.
4. B.Craseman and Z.D.Powell : Quantum Mechanics (AddisonWesley)
5. A.P. Messiah: QuantumMechanics.
6. J.J. Sakurai: Modern QuantumMechanics.
7. Mathews and Venkatesan: QuantumMechanics.
8. Bjorken and Drell :Relativstic QuantumMechanics.

PAPER –II: ATOMIC AND MOLECULAR PHYSICS

Unit-I Quantum states of one electron atoms-atomic orbitals, Hydrogen spectrum, spin-orbit(l-s) interaction energy, fine structure of hydrogen spectrum including l-s interaction and relativistic correction, spectra of alkali elements, fine structure in alkali spectra, penetrating and non-penetrating orbits, intensity rules.

Unit-II Pauli's principle, equivalent and non-equivalent electrons, ground state(basic level of different elements), two electron systems, interaction energy in L-S. and J-J. Coupling, Hyperfine structure, line broadening mechanisms (general ideas).

Unit – III Normal and anomalous Zeeman effect, early discoveries and developments, vector models of one electron system in a weak magnetic field, magnetic moment of a bound electron, magnetic interaction energy, selection rules, intensity rules, Paschen-Back(PB) effect – principal series effect, Zeeman and PB effects in hydrogen, Stark effect- discovery, Stark effect in Hydrogen, orbital model, weak and strong effect in Hydrogen.

Unit-IV Types of molecules: linear and diatomic molecules, symmetric top, asymmetric top and spherical top molecules. Rotational spectra of diatomic molecules: rigid rotator model, energy levels, Eigen functions, spectrum, comparison with observed spectrum and non-rigid rotator model, Intensities of spectral lines, microwave spectrometer, Raman spectrum; classical and quantum theory of Raman Effect, pure rotational Raman spectrum.

Unit-V Vibrational spectra of diatomic molecules: simple harmonic model, energy levels and spectrum, comparison with observed spectrum and anhormonic model, Vibrating rotators, Interaction of rotations and vibrations, fine structures and P-Q-R branches, IR spectrometer, Vibrational Raman spectrum, Vibrational rotational Raman spectrum.

TEXT AND REFERENCE BOOKS:

1. Introduction to atomic spectra - H.E. White(T).
2. Fundamentals of molecular spectroscopy – C.N. Banwell and E.M McCash(T).
3. Spectroscopy vol. I, II and III – Walker andstraughner.
4. Introduction to Molecular spectroscopy – G.M.Barrow.
5. Spectra of diatomic molecules –Herzberg.
6. Molecular spectroscopy – JeanneL.Mc-Hale.
7. Molecular spectroscopy – J.M.Brown.
8. Spectra of atoms and molecules–P.F.Bemath.
9. Modern spection copy, J.M.Holias.

PAPER – III: SOLID STATE PHYSICS-I

Unit- I: Electrons in Solids and Electronic Properties

Energy bands: nearly free electron model, origin of energy gap and its magnitude, Bloch function, Kronig-Penny model, Wave equation of electron in periodic potential, restatement of Bloch theorem, crystal moment of an electron, solution of Central equation, Kronig-Penny model in reciprocal space, empty lattice Approximation, approximate solution near zone boundary, Number of orbitals in a band, metals and insulators.

Unit -II: **Fermi surfaces and metals**

Effect of temperature on F-D distribution, free electron gas in three dimensions. Different zone schemes, reduced and periodic zones, construction of Fermi surfaces, nearly free electrons, electron, hole, open orbits, Calculation of energy bands, Tight binding, Wigner-Seitz, cohesive energy, pseudo potential methods. Experimental methods in Fermi surface studies, quantization of orbits in a magnetic field, de Haas van Alphen Effect, External orbits, Fermi surface of copper.

Unit- III: Crystal vibration and thermal properties

Lattice dynamics in monoatomic and diatomic lattice: two atoms per primitive basis, optical and acoustic modes, quantization of elastic waves, phonon momentum, inelastic neutron scattering by phonons, Anharmonic crystal interactions-thermal expansion, thermal conductivity, thermal resistivity of phonon gas, umklapp processes, imperfections.

Unit –IV: Electron-Phonon interaction- superconductivity

Experimental survey: occurrence of superconductivity, Destruction of superconductivity by magnetic field, Meissner effect, heat capacity, energy gap, MW, and IR properties, isotope effect. Theoretical survey : thermodynamics of superconducting transition, London equation, Coherence length, Cooper pairing due to phonons, BCS theory of superconductivity, BCS ground state, flux quantization of superconducting ring, duration of persistent currents, Type II superconductors, Vortex states, estimation of Hc1 and Hc2, single particle and Josephson superconductor tunneling, DC/AC Josephson effect, Macroscopic quantum interference. High temperature superconductors, critical fields and currents, Hall number, fullerenes ring.

Unit – V: Semiconductor crystals

Band gap, equation of motion, physical derivation of equation of motion, holes, effective mass, physical interpretation of effective mass, effective masses of semiconductors Si and Ge, intrinsic carrier concentration, intrinsic mobility, impurity conductivity, donor and acceptor states, thermal ionization of donors and acceptors, thermo-electric effects.

TEXT AND REFERENCE BOOKS:-

1. C. Kittel: Introduction to Solid State Physics (Wiley andSons).
2. J.M.Ziman: Principles of theory of solids (CambridgeUniv.Press).
3. Azaroff: X-raycrystallography.
4. Weertman and weertman : Elementary DislocationTheory.
5. Verma and Srivastava: Crystallography for Solid StatePhysics.
6. Azeroff and Buerger: The PowerMethod.
7. Buerger: Crystal StructureAnalysis.
8. Thomas: Transmission ElectronMicroscopy.
9. Omar: Elementary solid statephysics.
10. Ashcroft and Mermin: Solid StatePhysics.
11. Chalking and Lubensky: Principles of Condensed MatterPhysics.
12. Madelung: Introduction to solid statetheory.
13. Callaway: Quantum theory of solid statephysics.
14. Huang: Theoretical Solid StatePhysics.
15. Kittel: Quantum theory ofsolids.

PAPER –IV (A): ASTRONOMY AND ASTROPHYSICS-I

Unit - I Stars-apparent magnitudes, Colour index, Spectral classification, Stellar distances, Absolute magnitude, The H-R diagram of stars.
Stellar interiors: The basic equations of stellar structure, Hydrostatic equilibrium, Thermal equilibrium, Virial Theorem, Energy sources, Energy transport by radiation and convection, Equation of state

Unit - II Formation and evolution of stars: Inter stellar dust and gas, Formation of protostars, Pre-main sequence evolution, Post main sequence evolution and Evolution on the main sequence for low and high mass stars, Late stages of evolution, Fate of massive stars, Supernovae and its characteristics.

Unit – III End states of stars, degenerate states, White dwarfs, and Chandrasekhar limit, Neutron stars and Pulsars, Black holes.
Binary stars and their classification, close binaries, Roche Lobes, Evolution of semidetached systems: Algols, Cataclysmic variables and X-ray binaries.

Unit - IV Solar Physics: Physical Characteristics of sun, Photosphere: Limb darkening, Granulation, Faculae, Solar Chromosphere and Corona, Prominences, Solar Cycle and Sunspots, Solar Magnetic Fields, Theory of Sunspots, Solar flares, solar wind, Helioseismology.

Unit - V Observational and Conceptual foundations of Newtonian gravity and General Theory of Relativity(GR), Principle of Equivalence, Metric tensor, Covariant differentiation, Riemann curvature tensor, Geodesics.
Stress- Energy tensor, Einstein's field equations, Schwarzschild metric, Particle trajectories in Schwarzschild space- time, Precession of Perihelion, Gravitational red-shift and bending of light.

TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Camb. University Press,2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub.Co.
3. Introductory Astronomy and Astrophysics, M.Zeilik and S.A. Gregory, 4thedition, Saunders collegepublishing.
4. Theoretical Astrophysics, vol. – II: Stars and stellar systems, T. Padmanabhan, Cambridge universitypress.
5. The Physical Universe: An introduction to astronomy, F.Shu, Mill valley : University science books.

Paper – IV (B) ELECTRONICS (Communication)-I

Unit - I **Microwave devices**

Klystron ,magnetron & traveling wave tubes ,velocity modulation ,basic principal of two cavity klystrons & relex klystrons ,principle of operation of magnetrons ,helix traveling wave tubes.

Unit - II **Microwave wave guides &components**

(Wave modes) rectangular wave guides: solution of wave equation in rectangular coordinates, TE modes in rectangular wave guides, TM modes in rectangular wave guides, excitations of modes in rectangular wave guides.

Circular wave guides: solutions of wave equation in Cylindrical coordinates, TE modes in Circular wave guides, TM modes in Circular wave guides, TEM modes in Circular wave guides, excitations of modes in Circular wave guides.

Unit - III **Microwave cavities**: rectangular cavity resonator, circular –cavity resonator &semi –circular –cavity resonators Q- factor of a cavity resonator.

Transferred Electrons devices (TEDs)

Gunn effect diodes, principle of operation, modes of operations, read diodes, IMPATT diodes, TRAPATT diodes.

Microwave communications: advantages of microwave transmission, loss in free space, propagation of microwave, components of antennas used in MW communication system.

Unit - IV **Radar system**:

Radar block diagram &operation, radar frequencies ,pulse consideration, radar range equation ,derivation of radar range equation ,minimum detectable single receiver noise ,signal to noise ratio ,integration of radar pulses ,radar cross sections ,pulse reflections frequency ,antenna ,parameters ,systems losses & propagation losses ,radars transmitters receivers ,antennas displays

Unit - V **Satellite communication**

Orbital Satellite, geostationary satellite, orbital patterns ,look angles ,orbital spacing , satellite system ,link modules.

REFERENCEBOOKS

1) "Microwaves" by K.L. Gupta Wiley Estern Ltd.Delhi.
2) Advanced Electronic communication system by Wayne Tomsi Physicseducation.
3) Principle of communication of system-by Toub& Schilling: 2nd ed. TMH1994
4) Communication system: by SimanHaykin, 3rd ed. John wiley&sonsinc.1994.
5) Microwave devices & circuits by : Samuel, Y.Liau.
6) Electronic communication: Georgekennedy.

Paper IV (C) PHYSICS OF NANO MATERIALS - I

Unit-I: Nano Materials

Properties of Nano-Particles: Metal Nano-clusters: Magic Numbers, theoretical modeling of nanoparticles, geometric and electronic structure, Reactivity, Fluctuations, magnetic clusters, Bulk to Nano transition. Semiconducting nanoparticles: optical properties, Photo fragmentation, Columbic Explosion. Rare gas and molecular clusters: Inert-Gas Clusters, Superfluid Clusters, Molecular Clusters. Methods of Synthesis: RF Plasma, Chemical Methods, Thermolysis, Pulsed Laser Methods.

UNIT II: Carbon Nanostructures

Carbon Molecules: Nature of Carbon Bonds, New Carbon Structures. Carbon Clusters: Small Carbon Clusters, Discovery of C_{60}, Structure of C_{60} and its Crystal, Alkali-Doped C_{60}, Superconductivity in C_{60}, Larger and Smaller Fullerenes, Other Bucky balls. Carbon Nanotubes: Fabrication, structure, Electrical Properties, Vibrational Properties, Mechanical Properties. Applications of Carbon Nanotubes: Field Emission and Shielding, Computers, Fuel Cells, Chemical Sensors, Catalysis, Mechanical Reinforcement.

UNIT III: Bulk Nanostructured Materials

Solid Disordered Nanostructures: Methods of Synthesis, Failure Mechanisms of Conventional Grain-Sized Materials, Mechanical Properties, Nanostructured Multilayers, Electrical Properties, Other Properties, Metal Nano cluster Composite Glasses, Porous Silicon. Nanostructured Crystals: Natural Nano crystals, Computational Prediction of Cluster Lattices, Arrays of Nanoparticles in Zeolites, Crystals of Metal Nanoparticles, Nanoparticle Lattices in Colloidal Suspensions, Photonic Crystals. Nanostructured Ferromagnetism: Basics of Ferromagnetism, Effect of Bulk Nano structuring of Magnetic Properties, Dynamics of Nano magnets, Nano pore Containment of Magnetic Particles, Nano carbon Ferro magnets, Giant and Colossal Magneto resistance, Ferro fluids.

UNIT IV: Quantum Wells, Wires, and Dots

Preparation of Quantum Nanostructures, Size and Dimensionality Effects: Size Effects, Conduction Electrons and Dimensionality, Fermi Gas and Density of States, Potential Wells, Partial Confinement, Properties Dependent on Density of States. Excitons, Single- Electron Tunneling, Applications: Infrared Detectors, Quantum Dot Lasers. Superconductivity.

UNIT V: Self-Assembly and Catalysis

Self-Assembly: Process of Self-Assembly, Semiconductor Islands, Monolayers. Catalysis: Nature of Catalysis, Surface Area of Nanoparticles, Porous Materials, Pillared Clays, Colloids.

Nanomachines and Nanodevices: Microelectromechanical Systems (MEMSs), Nanoelectromechanical Systems (NEMSs): Fabrication, Nanodevices and Nanomachines. Molecular and Superamolecular Switches.

TEXT AND REFERENCE BOOKS

1. Nanostructures & Nanomaterials: Synthesis, Properties & Applications: Guozhang Cao.
2. Introduction to Nanotechnology: Charles P. Poole Jr and Franks J.Qwens.
3. Handbook of Analytical instruments, R.S.Khandpur
4. Nano materials: Synthesis properties ,characterization and application: A.S Edelstein and R.CCammaratra
5. Nanotechnology, Kohlr,Michael.
6. X-ray diffraction procedures, H. P. Klung andL.E.Alexander
7. The Powder Method IV. Azaroff and M. J.Buerger
8. Elements of X-ray diffraction, B.D.Cullity
9. Differential Thermal Analysis,R.C.Mackenzie
10. Thermal Methods of Analysis,W.W.Wendlandt
11. Synthesis, Functionalization and Surface treatment of Nanoparticles :MaricIsbella andBuraton
12. Encyclopedia of Nanotechnology, H.S.Nalwa
13. Handbook of Nanotechnology: Bhushan(Ed), Springer Verlag, New York(2004).
14. Nanostructures and Nanomaterials- Synthesis properties and Applications by Guozhong Cao (Empirical College Press World Scientific Pub.,2004).
15. Nanocomposite Science and Technology, Ajayan, Schadler andBraun
16. Fullerene & Carbon nanotubes, DresselShaus
17. Carbon Nanotubes,Elizer
18. Physical properties of CNT,Saito
19. Carbon nanotechnology, LimingDai
20. Nanotubes and nanowires, CNR Rao and Govindaraj RCSPublishing.
21. Nanotechnology in Biology and Medicine: Methods, Devices and Application by Tuan Vo-Dinh, CRC press,2007.
22. An Introduction to Quantum Computing Phillip Kaye, Raymond Laflamme, Michele Mosca
23. The Physics of Quantum Information: Quantum Cryptography, Quantum Teleportation, Quantum Computation by Dirk Bouwmeester, Artur K. Ekert, Anton Zeilinger
24. Problems And Solutions in Quantum Computing And Quantum Information Yorick Hardy Willi-HansSteeb

PAPER –IV (D): SPACE PHYSICS - I

Unit-I: Solar Physics

Physical Characteristics of sun, Source of solar energy, thermonuclear reaction and building up of higher elements, Description of solar internal and external layers, Photosphere: Limb darkening, Granulation, Faculae, Solar Chromosphere and Corona, Heating of the solar chromosphere and corona, Prominences, Solar Cycle and Sunspots, Solar Magnetic Fields, Theory of Sunspots, Solar flares, Solar wind, Coronal mass ejections, Helioseismology.

Unit-II: Planetary System

Solar planetary system, Major characteristics of the Planets, Atmospheric Composition, Planetary magnetism, Magnetic fields, Magnetic dipole, Asteroids, Comets, Extra Solar Planets, Magnetic fields of Extra Solar Planets

Unit-III: Celestial Mechanics

Time and Coordinate system: Celestial Sphere, Solar Time, Sidereal Time, Julian Date, Right Ascension and Declination, Azimuth and Elevation, galactic coordinates, WGS 84 coordinate system. GPS – operation, accuracy, time and position information.

Unit-IV: Space and Observational tools

Electromagnetic bands of observation: radio, infrared, optical, UV, X-ray and Gamma-ray windows. Ground-based, balloon-borne and satellite-borne telescopes, Resolution of Instruments and Limitations, Optical telescopes, Photometers, Spectrographs, CCDs, Polarimeters. Radio telescopes - interferometry, X-ray and Gamma-ray detectors, Neutrino and Cosmic Ray astronomy, Radar.

Unit-V: Space Missions

Planetary Exploration, Early spacecraft visits to the moon, Unmanned Lunar landers; The Apollo program - man on the moon – instruments and experiments, Lunar structures; Exploration of Mercury, Venus, Mars - the Red Planet – Structure of Mars, Martian atmosphere; ice at the poles, Martian landscapes: linear features, volcanoes, and impact craters; exotic terrains; Study of Planetary moons with space missions, The Cassini-Huygens Mission, The Deep Impact Mission. Search for extra-terrestrial life – SETI experiments.

Text and Reference Books

1. Solar System Astrophysics, J. C. Brandt and P. W.Hodge
2. Introduction to Experimental Physics, W. B. Fretter.
3. The Magnetic Field of the Earth, Roland T. Merrill, Michael W. Mc Elhinny, Phillip L. Mcfadden, Academic Press
4. Physics of Geomagnetic Phenomena, Vol. I and II, S. Matsushita. and W. H. Campbell, Academic Press
5. Earth's Magnetospheric Process, Ed. B. M. Mc Cormac, D. Reidel Publishers
6. Physics of the Magnetosphere, Eds. R. L. Corovillano, J. T. McCaulley and H. Radosky, D. Reidel Publishers
7. Solar System Plasma Physics, Vol. I, II and III, Eds. C. F. Kennel, L. J.Lanzenrutti and E. N. Parker
8. Dynamics of the Geomagnetically Trapped Radiation (Physics and Chemistry in Space, Vol II)
9. Solar Terrestrial Physics, Ed. E. R. Dyer, D. Reidel Publishers
10. Solar Magneto–Hydrodynamics, E.R. Priest; D Reidel,1982
11. R.C. Smith, Observational Astrophysics; CUP,1995.
12. C.R. Kitchin, Astrophysical Techniques; Adam Hilger,1984.
13. Digital Image Processing, R. C. Gonzales and R. E. Woods, 2nd Ed, Pearson India, 2002
14. Satellite Meteorology, S. Q. Kidder and T. H. Von der Haar, Academic Press,1995
15. Lecture Notes on Satellite Meteorology, Vol 1 and 2, SAC, Ahmedabad
16. Remote Sensing and Image Interpretation, T. M. Lillesand and R. W. Kieffer, John Wiley,2002
17. Fundamentals of Space Systems, V. L. Pisacane and R. C. Moore, Oxford University Press,1994
18. Fundamentals of Remote Sensing, George Joseph,2003
19. Processing Remote Sensing Data, M. C. Girgard and C. Girgard, Oxford-IBH,1999
20. Quantitative Remote Sensing of Land Surfaces, Shunlin Liang, WileyInter science, 2004
21. Scale in Remote Sensing and GIS, D. A. Quattrachi and M. F.Goodchild
22. Theory of Satellite Orbits in an Atmosphere, King-Hele Desmond, Butterworths, 1964
23. Uncertainty in Remote Sensing and GIS, Ed: G. M. Foddy and P. M.Atkinson
24. Remote Sensing by GeorgeJoseph
25. Concepts in Space Sciences Edited by R.R.Daniel
26. Mathematical Principles of Remote Sensing by A..Milman

27. An Introduction to Ionosphere and Magnetosphere, J. A.Raticliffe
28. Solar System Astrophysics, J. C. Brandft and P. W.Hodge
29. Plasma Diagnostic Techniques, R. H. Huddlestone and S. L.Leonard
30. Introduction to Experimental Physics, W. B.Fretter
30. High Vacuum Techniques, J.Yarwood
31. Plasma Diagnostics, Vol. I, O. Anciello and D. L.Flamn
32. The Earth's Ionosphere: Plasma Physics and Electrodynamics, Michael C.Kelley, AcademicPress
33. Ionospheric Techniques and Phenomena, A. Giraud and M. Petit, D. ReidelPublish.
34. Physics of Geomagnetic Phenomena, Vol. I and II, S. Matsushita and W. H. Campbell, AcademicPress
35. Introduction to Ionospheric Physics, H. Risbeth and H. Garriot, AcademicPress
36. Space Weather, Physics and Effects by Volker Bothmer and Loannis.A.Depli Springer
37. Aerospace Environment by TBeer
38. Free flight of a rocket ByGantmaker
39. Orbital Mechanics, Ed. Vladimir A, Chobotov, AIAA EdnSeries
39. Introduction to Celestial Mechanics, S. W. McCusky,Addison-Wesley
40. Fundamentals of Astrodynamics, R. R. Bates et al,Dover
41. Orbital Motion, A. E. Roy, Adam HinglarLtd
42. Orbital Methods in Astrodynamics, P. R. Escobal, JohnWiley
43. Fundmentals of Astrodynamics, R. R. Bates et al,Dover
44. Orbital Motion, A. E. Roy, Adam HinglarLtd
45. Design of Orbital Flights, J. Johnson et al., McGrawHill
46. Modern Astrophyiscs, B. W. Carroll and D. A. Ostlie, Addison-Wesley
47. The Physical Universe, F. Shu, University ScienceBooks
48. The Physics of Astrophysics, Vol. I and II, F. Shu, University ScienceBooks
49. Theoretical Astrophysics, Vol. I, II and III, T. Padmanabhan, CambridgeUni.Press
50. The Physics of Fluids and Plasmas, Arnab Rai Choudhuri, CambridgeUni.Press
51. Astrophysical Concepts, M. Harwitt,Springer-Verlag
52. Galactic Astronomy, J. Binney and M. Merrifeld, Princeton UniversityPress
53. Galactic Dynamics, J. Binney and S. Tremaine, Princeton UniversityPress
54. Quasars and Active Galactic Nuclei, A. K. Kembhavi and J. V. Narlikar,Cambridge UniversityPress
55. An Introduction to Active Galactic Nucleii, B. M.Peterson

Lab III-A: Materials Science & General

At least ten experiments should be performed from the following list of experiments or parallel level experiment depending upon the facilities available.

1. To determine activation energy of ionic/superionic solid by Temperature depended conductivity measurement.
2. To study Electron Spin(ESR) Resonance in DPPH (Diphenyl Pricyl Hydrazy) sample.
3. To study I-V characteristics of photovoltaic solar cell and find the efficiency.
4. To study the decay of photoconductivity of given sample and find out trap depth.
5. Study of decay of photoluminescence of a given sample.
6. Measurement of electrical conductivity using Impedance Spectroscopy technique.
7. To determine drift velocities of Ag+ ion in AgI from temperature dependence of ionic transference number study.
8. Electrical conductivity of Ball milled/Mechano-chemical synthesized materials.
9. Determination of strength of a given radioactive source.
10. Study of complete spectra of radioactive sources, and study of photo peak efficiency of NaI(Tl) crystal for different energy gamma rays.
11. Structural analysis of powder sample by XRD and particle size determination using Scherrer's formula.
12. FTIR studies of solid samples.
13. Mechanoluminescence of sucrose crystals.
14. Thermoluminescence of irradiated samples.
15. Study of Op-Amp.-IC-741 is inverting/ Non inverting amplifier and draw frequency response curve.
16. Construction of Schmitt triggers using IC-741 and study of its characteristics.
17. Study of Astable and monostable Multi Vibrator using IC555.
18. Digital electronics experiments on bread board usingIC-7400.

Lab III-B: Astronomy & Astrophysics

1. Study of Quasar.
2. Study of the orbit of a visual binary Star.
3. Determine the mass of Saturn &its rotational velocity.
4. Verification of Hubble's law and determination of Hubble'sconstant.
5. Identification of element from Fraunhoffer spectrum of the sun.
6. Study of sunspots.
7. Study of light curves of Cepheid variable stars.
8. Study of Proper motion of stars.
9. Determination of Pulsar period and distance.
10. Photo-electric photometry of Pleiades star cluster.
11. Study of expansion of the universe and calculate the age of the Universe.

OR III -B: Electronics

(1) Experiments with microprocessor. (a)Convert BCD in to binary & vice versa.
(b) To transfer group of data blocks from one location to another location.
(c) To write programme for addition &subtraction.
(d) To write programme for multiplication &division.
(2) Logic gate study DTL &RTL.
(3) To study& verify the Demerging's Theorem.
(4) Study of Adder/Subtract or.
(5) Study of Encoder &Decoder.
(6) Study of Multiplexer &DE multiplexer
(7) Study of digital to analog converter.
(8) Study of analog to digital converter.
(9) Study of 4-bit Counter/ ripple Counter.
(10) Study of left/right shift register.
(11) Study of read only memory.
(12) Study of Random Access Memory.
(13) Study of Phase locked loop.
(14) Study of BCD to seven segments Decoder.
(15) Study of modulation & demodulation.
(16) Optical fiber based experiment.
(17) Microwave characterization and measurements.

OR III -B: Physics of Nano-material

(1) Synthesis of II-IV semiconductor nanoparticles by Wet chemical method.
(2) Synthesis of nanoparticles (ZrO_2) by Combustion method.
(3) Synthesis of nanoparticles by Sol-gel method.
(4) Synthesis of nanoparticles by Ball milling method.
(5) Synthesis of Quantum cells structures using vacuum coating unit.
(6) Synthesis of nanoparticles using Solid state reaction method.
(7) Measurement of band gap energy and size of the nano particle of II-IV semiconductor using absorption spectrophotometer.
(8) To make the peak analysis of IR transmission spectra of nanoparticle using FTIR spectrometer.
(9) Study of effect of capping agent on the size of the nanoparticle during synthesis.
(10) To determine the average particle size of nano materials by XRD using Sherer's formula.
(11) To determine the Hall coefficient and carrier type for a semiconducting nanoparticles.
(12) To determine the Band gap of a given semiconductor using Four probe method from room temperature to 100°C.
(13) To determine the average size of nanoparticles using Zetasizer.
(14) To measure the change of dielectric constant and dielectric loss of nanoparticle with the change of signal frequency by impedance analyzer.
(15) To characterize the mechanical properties by tensile testing.
(16) To estimate the particle size by SEM.
(17) To perform electron diffraction analysis from TEM image.
(18) To do roughness analysis of nanostructured sample using AFM.

OR III -B: Space Physics

1. The flow of energy out of the Sun.
2. Study of Sun-spot.
3. Astrometry of asteroids.
4. Study of expansion of the universe and calculate the age of the Universe.
5. Identification of element from Fraunh offer spectrum of the sun.
7. The transit of Venus and Mercury.
8. Jupiter's Moon and speed of light.
9. Determination of Pulsar period and distance.
10. Photo-electric photometry of Pleiades star cluster.
11. The large scale structure of the Universe.

Semester – IV

(2019-2020)

PAPER – I: NUCLEAR AND PARTICLE PHYSICS

Unit-I **Nuclear Interactions:** Nucleon-nucleon interaction, Two-nucleon system, The ground state of the deuteron, Tensor forces, Nucleon-nucleon scattering at low energy, Scattering length, Effective range theory, Spin dependence of nuclear forces, Charge independence and charge symmetry of nuclear forces, Iso-spin formalism, Exchange forces, Meson theory of nuclear forces and the Yukawa interaction.

Unit-II **Nuclear Reactions:** Reaction energetics: Q-equation and threshold energies, Reactions cross sections, Resonance: Breit-Wigner single-level formula, Direct and compound nuclear reactions, Formal reaction theory: Partial wave approach and phase shifts, Scattering matrix, Reciprocity theorem,

Unit-III **Nuclear Decay:** Beta decay, Femi's theory of beta decay, Shape of the beta spectrum, Total decay rate, Angular momentum and parity selection rules, Comparative half-lives, Allowed and forbidden transitions, Selection rules, Parity violation, Two component theory of neutrino decay, Detection and properties of neutrino

Gamma decay, multiple transitions in nuclei, Angular momentum and Parity selection rules, internal conversion, nuclear isomerism.

Unit – IV **Nuclear models:** Liquid drop model, Bohr-Wheeler theory of fission, Shell Model, Experimental evidence for shell effects, Single particle shell model, Spin-orbit interaction and magic numbers, Analysis of shell model predictions, Magnetic moments and Schmidt lines, Collective model of Bohr and Mottelson.

Unit - V **Elementary particle Physics:** The fundamental interactions, Classification of elementary particles, Leptons and Hadrons, Symmetries, groups and conservation laws, SU(2) and SU(3) multiples and their properties, Quark model, Properties of Quarks, the standard model.

TEXT AND REFERENCE BOOKS:

1. A. Bohr and B.R. Mottelson, Nuclear structure, vol. 1 (1969) and vol.2, Benjamin, Reading, A,1975.
2. Kenneth S. Kiane, Introductory Nuclear Physics, Wiley, New York,1988.
3. Ghoshal, Atomic and Nuclear Physicsvol.2.
4. P.H. Perking, Introduction to high energy physics, Addison-Wesley, London, 1982.
5. Shriokov Yudin, Nuclear Physics vol.1 & 2, Mir Publishers, Moscow, 1982.
6. D. Griffiths, introduction to elementary particles, harper and row, New York, 1987.
7. H.A. Enov, introduction to Nuclear Physics, Addison-Wesley, 1973.
8. G,E. Brown and A.D. Jackson, Nucleon-Nucleon interaction North-hall and Amsterdam, 1976.
9. S.D. Benedetti, Nuclear interaction, John Willey and sons, New York, 1964.

10. M.K. Pal, theory of Nuclear structure, affiliated East West, Madras,1982.
11. Y.R. Waghmare, introductory nuclear physics, Oxford, IBH, Bombay,1981.
12. J.M. Longo, elementary particles, McGraw Hill, New York,1971.
13. R.R. Roy and B.P. Nigam, Nuclear Physics, Wiley- Easterm Ltd.1983.

PAPER – II LASER PHYSICS AND APPLICATIONS

Unit-I Laser Characteristics–

Spontaneous and stimulated emission, Einstein's quantum theory of radiation, theory of some optical processes, coherence and monochromacity, kinetics of optical absorption, line broadening mechanism, Basic principle of lasers, population inversion, laser pumping, two & three level laser systems, resonator, Q-factor, losses in cavity, threshold condition, quantum yield.

Unit – II Laser Systems

Solid state lasers- the ruby laser, Nd: YAG laser, ND: Glass laser, semiconductor lasers – features of semiconductor lasers, intrinsic semiconductor lasers, Gas laser - neutral atom gas laser, He-Ne laser, molecular gas lasers, CO2 laser, Liquid lasers, dye lasers and chemical laser.

Unit-III Advances in laser Physics

Production of giant pulse -Q-switching, giant pulse dynamics, laser amplifiers, mode locking and pulling, Non-linear optics, Harmonic generation, second harmonic generation, Phase matching, third harmonic generation, optical mixing, parametric generation and self-focusing of light.

Unit –IV Multi-photon processes; multi-quantum photoelectric effect, Theory of two-photon process, three- photon process, second harmonic generation, parametric generation of light, Laser spectroscopy: Rayleigh and Raman scattering, Stimulated Raman effect, Hyper-Raman effect, Coherent anti-stokes Raman Scattering, Photo-acoustic Raman spectroscopy.

Unit – V Laser Applications – ether drift and absolute rotation of the Earth**,** isotope separation, plasma, thermonuclear fusion, laser applications in chemistry, biology, astronomy, engineering and medicine.

Communication by lasers: ranging, fiber Optics Communication**,** Optical fiber, numerical aperture, propagation of light in a medium with variable index, pulse dispersion.

TEXT AND REFERENCE BOOKS:

1. Laud, B.B.: Lasers and nonlinear optics, (New AgeInt.Pub.1996).
2. Thyagarajan, K and Ghatak, A.K.: Lasers theory and applications (Plenum press, 1981).
3. Ghatak, A.K. and Thyagarajan, K : Optical electronics (Cambridge Univ. Press 1999).
4. Seigman, A.E.: Lasers (Oxford Univ. Press1986)
5. Maitland, A. and Dunn, M.H. : Laser Physics (N.H.Amsterdam,1969).
6. Hecht, J. The laser Guide book (McGraw Hill, NY,1986).
7. Demtroder, W.: Laser Spectroscopy (Springe series in chemical physics vol.5, Springeverlag, Berlin,1981).
8. Harper, P.G. and Wherrett B.S. (Ed.): Non-linear-optics (Acad.press,1977).

PAPER – III: SOLID STATE PHYSICS- II

Unit- I*:* **Plasmon's, Polaritons**

Dielectric function of the electron gas, Plasma optics, Dispersion relation for EM wave, Transverse optical modes in Plasma, Transparency of Alkali metals in the ultraviolet, Longitudinal Plasma oscillations, Plasmon, electrostatic screening and screened Coulomb potential, Mott metal-insulator transition, screening and phonons in metals, Polaritons, LST relation.

Unit –II: **Dielectric and ferroelectrics**

Maxwell's equations, polarization, macroscopic electric field, depolarization filed, E1;local electric field at an atom, Lorentz filed E2, fields of dipoles inside cavity E3; dielectric constant and polarizability, electronic polarizability; structural phase transition; ferro-electric crystals, classification; displacive transition, soft optical phonons, Landau theory of phase transitions, first and second order transition, antiferro-electricity, ferro- electric domain, piezoelectricity, ferro-elasticity, optical ceramics.

Unit –III: **Magnetism**

General ideas of dia- and para- magnetisms, quantum theory of paramagnetism, rare earth ions, Hund rule, iron group ions, crystal field splitting, quenching of orbital angular momentum, spectroscopic splitting factor, van vleck temperature dependent paramagnetism, Cooling by isentropic demagnetization, nuclear demagnetization, paramagnetic Susceptibility of conduction electrons.

Unit –IV: **Ferromagnetism and anti-ferromagnetism**

Ferromagnetic order, Curie point and exchange integral, temp dependence of saturation magnetization, saturation magnetization at absolute zero; magnons, quantization of spin waves, thermal excitation of magnons; neutron magnetic scattering, Ferrimagnetic order, Curie temp and susceptibility of ferrimagnets, iron garnets. Antiferromagnetic order, susceptibility below neel temp, antiferromagnetic magnons, ferromagnetic domains.

Unit – V: **Optical Processes &Excitons and defects**

Optical reflectance, excitons, Frenkel and Mott-Wannier excitons, Alkali Halides and Molecular crystals Defects: lattice vacancies, Schottkey and Frenkel point effects, colour centers, F and other centers, Line defect. Shear strength of single crystals, dislocations- edge and screw dislocations, Burger vectors, Stress fields of dislocations, low angle grain boundaries, dislocation densities, dislocation multiplication and slip, strength of alloys, dislocations and crystal growth, hardness of materials**.**

TEXT AND REFERENCE BOOKS

1. C. Kittel: Introduction to Solid State Physics (Wiley and Sons).
2. J.M. Ziman: Principles of theory of solids (Cambridgeuniv. press).
3. Azaroff : X-ray crystallography.
4. Weertman and weertman : Elementary Dislocation Theory.
5. Verma and Srivastava: Crystallography for Solid State Physics.
6. Azeroff and Buerger: The Power Method.
7. Buerger: Crystal Structure Analysis.
8. Thomas: Transmission Electron Microscopy.
9. Omar: Elementary solid state physics.
10. Aschroft and Mermin : Solid State Physics.
11. Chalking and Lubensky: Principles of Condensed Matter Physics.
12. Madelung : Introduction to solid state theory.
13. Callaway: Quantum theory of solid state physics.
14. Huang: Theoretical Solid State Physics.
15. Kittel: Quantum theory of solids.

PAPER –IV (A): ASTRONOMY AND ASTROPHYSICS - II

Unit– I The Milky Way Galaxy: Structure of the Milky way, Oort's theory of galactic rotation, Dynamics of the spiral arms, Distribution of Interstellar matter, Central regions of the Milky way. Normal Galaxies: Classification of galaxies, Hubble sequence: Elliptical, Lenticulars and Spiral galaxies, and their properties, Distribution of light and mass in galaxies, Brightness profiles, Distribution of gas and dust in galaxies.

Unit- II Active galaxies: Active Galactic Nuclei (AGNs), Seyfert galaxies, BL Lac Objects, Radio galaxies: General properties, Superluminal motion, Quasars: Properties and Energy requirements, Nature of quasar redshifts, Supermassive black hole model and Unified model of AGNs.

Unit- III Cosmology: Cosmological principle, Observational support and other arguments to support cosmological principle, Fundamental observers and co-moving frame, Robertson-Walker line element (without derivation), Observational features of Robertson-Walker space time e.g. Red shift etc, Models of the universe, Friedmann models, Quantitative predictions of FRW model, Quantitative solutions, Open and closed universes, Hubble's law, Angular size, Source counts, Models with the cosmological constant, Steady state cosmology.

Unit- IV Relics of the big bang, the early universe, Thermodynamics of the early universe, Thermal History, Primordial neutrinos, Helium synthesis and other nuclei, Microwave background, the very early universe, the formation of structures in the Universe, Jeans Mass, Growth Rate, Recombination era, Onset of matter dominated era.

Unit- V Observations of the cosmological significance, Measurement of Hubble`s constant, Anisotropy of local large - scale velocity fields, Age of the universe, Abundance of light nuclei, Dark matter, the redshift-magnitude relation, Number counts of extragalactic objects, The variation of angular sizes with distance.

TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge Uni.ty Press,2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub.Co.
3. Introductory Astronomy and Astrophysics, M. Zeilik and S.A. Gregory, 4th edition, Saunders college publishing.
4. Theoretical Astrophysics, vol. – II: Stars and stellar systems, T. Padmanabhan, Cambridge university press.
5. The Physical universe: An introduction to astronomy, F. Shu, Millvalley: University science books.
6. Textbook of astronomy and astrophysics with elements of cosmology, V.B. Bhatia, Pb -New Delhi, Narosa publishing house.
7. The new cosmos, A. Unsold and B. Baschek, Newyork, Springer Velas.
8. Quasars and active galactic neuclei, A.K. Kembhavi and J.V. Narlikar, Cambridge university press.
9. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison Wesley publish.co.
10. Introductory astronomy and astrophysics, M.Zeilik and S.A.Greogry, 4 th edition, Saunders college publishing.
11. Theoretical Astrophysics, vol. I: Astrophysical processes T. Padmanabhan, Cambridge university press.
12. Introduction to cosmology, J.V. Narlikar, 3 rd edition, Cambridge uni. press.
13. Structure formation in the universe, T. Padmanbhan, Cambridge University, press.
14. General relativity and cosmology, J.V. Narlikar-Delhi: Macmil. Comp.of Indialtd.
15. Galactic Astronomy: Binney and Merrifield.

Paper – IV (B) Electronics II (Communication)

Unit-I **Digital communications**

Pulse modulation systems, Sampling Theorem, Low pass &Band pass signal, PAM- Channel BE for PAM signal, Natural Sampling, Plat-top sampling, Signal through holding, Quantization of signals, quantization error.

Unit-II **Digital modulation techniques**

PCM, Differential PCM, Delta modulation, Adaptive, delta modulation (CVSD). BPSK, DPSK, QPSK, PSK, QASK, BFSK, FSK, MSK

Unit-III **Mathematical representation of noise**

Sources of noise, Frequency domain representation of noise, Effect of filtering on the probability density of Gaussian noise, Spectral component of noise, Effect of a filter on the power spectral density of noise, Superposition of noise, Mixing involving noise, binear filtering, Noise bandwidth, Quadrature component o f

noise, Power spectral density of nc(t) n_s (t) & their time derivatives.

Unit-IV **Data Transmission I**

Base band signal receiver, Probability of error optimum filter, White noise: Matched filter & probability of error, Coherent reception correlation, PSK, FSK, Non-Coherence detection on FSK, Differential PSK, QASK, Calculation of error probability for BPSK, BSFK, QPSK.

Unit-V **Data Transmission II**

Noise in pulse code & delta modulation system, PCM transmission, Calculation of quantization noise output signal power, Effect of thermal noise, output signal to noise ratio in PCM, DM, Quantization noise in DM, output signal power, DM output signal to quantization noise ratio, effect of thermal noise in delta modulation, output signal to niose ratio in DM

Text and Reference Books:

1) "Microwaves" by K.L. Gupta Wiley Estern Ltd. Delhi.
2) Advanced Electronic communication system by Wayne Tomsi Physics education.
3) Principle of communication of system-by Toub & Schilling: second edition TMH 1994
4) Communication system: by siman Haykin, third edition John wiley & sons inc.1994.
5) Microwave devices & cktsby: Samuel, Y. Liau.
6) Electronic communication: George kennedy.

Paper – IV (C) PHYSICS OF NANO MATERIALS- II

UNIT I: Synthesis of Nano-materials

Top-down & Bottom-up approaches: Kinetically confined synthesis of nanoparticles: micro emulsion and spray pyrolysis. Template based synthesis: Electrochemical deposition, Physical Vapour deposition, Chemical Vapour deposition, Electron Beam Lithography (EBL), X-ray Lithography (XRL).

Chemical Route synthesis of Nanomaterials: Chemical precipitation and co- precipitation, Chemical Bath Deposition (CBD), Sol-gel, Combustion technique.

UNIT II: Characterization of Nano-materials (a)

X- ray Diffraction (XRD), powder and single crystal Diffraction, X-ray fluorescence (XRF), X ray photoelectron spectroscopy (XPS), Energy Dispersive X-ray analysis (EDAX), Thermo analytic Methods: Thermo Gravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), Differential Thermal Analysis(DTA).

UNIT III: Characterization of Nano-materials (b)

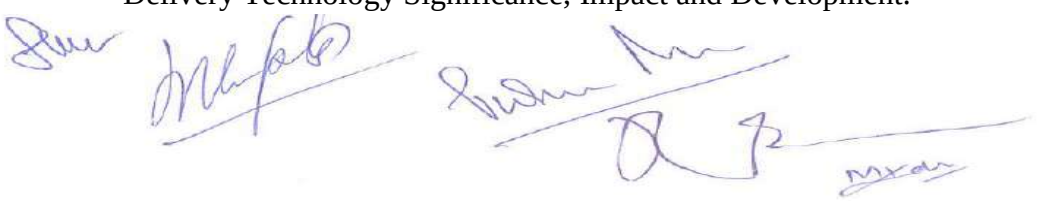
Scanning Tunneling Microscopy (STM), Contact and non-contact Atomic Force Microscopy (AFM), Conductive AFM. Scanning Electron Microscopy (SEM), Transmission electron microscopy (TEM), High resolution TEM Field emission SEM. Spectrophotometer: UV-Vis spectrophotometers, IR spectrophotometers, Fourier Transform Infrared Radiation (FTIR), Photoluminescence (PL), electroluminescence and thermoluminescence spectroscopy.

UNIT IV: Applications of Nano-materials

Quantum wells, wires and dots. Organic Semiconductors, Organic Light Emitting Diodes (OLEDs), self-assembly of complex organic molecules, molecular switches, thermochromic switches, Motor molecules and bio-mimetic components, charge transfer complexes, molecular connections, contact issues, conducting polymers, light emitting polymers, polymer-polymer heterostructures, plastic FETs, photodiodes &solar cells, Nano Robotics: Nano robots and NEMS, Sensors and actuators, Artificial molecular machines, Biomotors, Other Nano machines, Propulsion, Control, Communication, Programming and coordination.

UNIT V: Nano Sensors and Biomedical applications

Nanosensors: Gas sensors, Pollution sensor, Photo sensor, Temperature sensor, IR detector, Biosensor, nanomaterial gas discharge devices, CNT based fluid velocity sensor. Nanoparticle in Drug delivery, Targeting Legends, Cancer Treatment, Mediated Delivery of Sirna, Nanonephrology, Nanosystems in Inflammation, Targeting Macrophages to Control Inflammation, Tissue Regeneration, Growth And Repair, Tissue Bioengineering, Future Understanding for Treatment, nanosurgery, Drug Delivery Technology Significance, Impact and Development.



References: Books/ Research Monographs

1. Nanostructures & Nanomaterials: Synthesis, Properties & Applications: Guozhang Cao.
2. Introduction to Nanotechnology: Charles P. Poole Jr and Franks J. Qwens.
3. Handbook of Analytical instruments, R.S. Khandpur
4. Nano materials: Synthesis properties ,characterization and application: A.S Edelstein and R.CCammaratra
5. Nano electronicsand Nanosystems, Karl Goser, Peter Glosekotter, Jan Dienstuhl.,
6. Springer,2004
7. Nanomaterial Systems Properties and Application, A.S.Eldestein and R.C.Cammarata.
8. Handbook of Nanotechnology: Bhushan(Ed), Springer Verlag, New York(2004).
9. Nanocomposite Science and Technology, Ajayan, Schadler and Braun
10. Piezoelectric Sensors: Force, Strain, Pressure, Acceleration and Acoustic Emission
11. Sensors, Materials and Amplifiers, G. Gautschi.
12. Block Copolymers in Nanoscience Massimo Lazzari
13. Supramolecular Chemistry, Jonathan W. Steed, Jerry L. Atwood
14. Nanotechnology: Importance and Application by M.H. Fulekar, IK International, 2010.
15. Nanotechnology in Biology and Medicine: Methods, Devices and Application by Tuan Vo-Dinh, CRC press,2007.
16. Nano system characterization tools in the life sciences by Challa Kumar. Wiley- VCH,
17. 2006.
18. Nanolithography M.Gentili etal.(edits),Springer.
19. Environanotechnology by Mao Hong fan, Chin-pao Huang, Alan E Bland, Z Honglin
20. Wang, RachidSliman, Ian Wright. Elsevier,2010.
21. Nanotechnologies, Hazards and Resource efficiency by M. Steinfeldt, Avon Gleich, U. Petschow, R. Haum. Springer, 2007.
22. Nanotechnlogy: Health and Environmental risk by Jo Anne Shatkin. CRC press, 2008.
23. An Introduction to Quantum Computing Phillip Kaye, Raymond Laflamme, Michele
24. Mosca
25. The Physics of Quantum Information: Quantum Cryptography, Quantum
26. Teleportation, Quantum Computation by Dirk Bouwmeester, Artur K. Ekert,Anton
27. Zeilinger
28. Problems and Solutions in Quantum Computing And Quantum Information Yorick Hardy Willi-HansSteeb

PAPER –IV (D): SPACE PHYSICS – II

Unit I: Glimpse of Universe

Universe - description, origin, its evolution, age and size; Stars–birth, life, death, spectral analysis, stellar composition - element synthesis in stars, Exotic stars- novae, supernovae, pulsars, black holes and gamma ray bursts; Galaxies; Starbursts and Active Galactic Nucleus; Evidence for the Big Bang; Cosmic Background Radiation; Expansion Models; Dark Matter and Energy Recent innovations about the concept of Universe: Dark Energy and an accelerating universe

Unit II: Spacecraft& Satellites

Satellite orbits and attitude: principles of satellite motion, Kepler's laws, orbital elements, satellite attitude and its control, types of orbits, polar and geostationary, earth and Sun-synchronous, orbit optimization, viewing geometry, launch vehicles and spacecraft, rocket propulsion concepts such as solid, hybrid, liquid, nuclear and antimatter. Rocket motors and their design, flight stability and recovery systems, stability and control system.

Unit III: Remote Sensing

Sensors and systems: visible, infrared, water vapour and microwave sensors, sensor characteristics, sensor materials, passive and active sensors, scanning radiometers, spectral signatures.

Satellite data processing: satellite data acquisition, satellite communications, data collection platforms, earth station, image processing, geometric and radiometric corrections, image navigation, registration, image enhancement techniques, noise removal methods, histogram methods, density slicing, image classification.

Applications of remote sensing in earth resources management, agriculture, forestry, water resources and disaster mitigation

Unit IV: Solar Wind and Interactions

The ionospheric layers D, E, F and their formation, effect of radiation on earth's atmosphere, photochemical processes,

Geomagnetic and magnetic coordinates, poles, measurement of geomagnetic field components, micro pulsation indices, variations of geomagnetic field, quiet and disturbed variations, geomagnetic storms, equatorial and auroral phenomena.

Solar wind, model of solar winds, interaction in the interplanetary medium and with the planets. Magnetosphere: interaction of solar wind with the geomagnetic field and formation of the magnetospheric tail, storm and sub-storm phenomena, Van Allen radiation belts

Unit V: Space Weather

Space Weather Effects on Communication, Space Weather Effects on Power Grids, Space Radiation Protection, Effects on Spacecraft's hardware and Operations, Effects on Satellite Navigation, Forecast of Space Weather.

Text and Reference Books

Same as mentioned in Semester III, Paper IV (D)

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.Sc. (Botany) Semester Exam

UNDER

FACULTY OF LIFE SCIENCE

Session 2019-20

(Approved by Board of Studies)

Effective from July 2019

SYLLABUS M.Sc. BOTANY

Semester	Paper	Title	External marks	Internal marks	Credit
First	I	Cytology	80	20	4
	II	Genetics	80	20	4
	III	Microbiology, Phycology and Mycology	80	20	4
	IV	Bryophyte, Pteridophyta and Gymnosperm	80	20	4
	LC - I	Lab Course-I (Based on paper I &III)	80	20	4
	LC - II	Lab Course-II (Based on paper II &IV)	80	20	4
Second	I	Taxonomy and diversity of plants	80	20	4
	II	Molecular Biology	80	20	4
	III	Plant physiology	80	20	4
	IV	Plant metabolism	80	20	4
	LC- I	Lab Course-I (Based on paper I &II)	80	20	4
	LC-II	Lab Course-II (Based on paper III &IV)	80	20	4
Third	I	Plant development and plant resources	80	20	4
	II	Plant Ecology– I **(**Ecosystem and vegetation ecology)	80	20	4
	III	Biotechnology I (Genetic engineering of plants & microbes)	80	20	4
	IV	**Elective paper-1** Molecular plant pathology-I **OR** **Elective paper-II** Limnology-I **OR** **Elective paper-III** Ethno botany I	80	20	4
	LC-I	Lab Course-I (Based on paper I &II)	80	20	4
	LC-II	Lab Course-II (Based on paper III &IV)	80	20	4

Fourth	I	Plant reproduction and plant resources utilization	80	20	4
	II	Plant Ecology II (Pollution and biodiversity conservation)	80	20	4
	III	Biotechnology II (Plant cell, tissue culture & organ culture)	80	20	4
	IV	**Elective paper-1** Molecular plant pathology-II **OR Elective paper-II** Limnology-II **OR Elective paper-III** Ethno botany II	80	20	4
	LC-I	Lab Course-I (Based on paper I &II)	80	20	4
	LC-II	Lab Course-II (Based on paper III &IV)	80	20	4

Choice Based Credit System: Semester II **Course Forestry seed Technology.**
Marks 100, Credit Points -03, Total Hours -50

Choice Based Credit System: Semester III **Course Environmental Science.**
Marks 100, Credit Points -03, Total Hours -50

- Each theory paper will have 5 questions of equal marks. First question will encompass all the five units without internal choice, whereas rest questions will be unit wise with internal choice.
- The respective teachers on each paper will ensure the internal evaluation by a class test and a seminar / poster presentation of 20 marks each and submit the foil and counter foil to the HOD by the end of the activity.

SCHEME OF EXAMINATION, 2019-2020
M.Sc. I SEMESTER, BOTANY
THEORY

PAPER	TITLE	MAX. MARKS	Internal Assessment/ seminar	Total marks
I	CYTOLOGY	80	20	100
II	GENETICS	80	20	100
III	MICROBIOLOGY,PHYCOLOGY AND MYCOLOGY	80	20	100
IV	BRYOPHYTA,PTERIDOPHYTA AND GYMNOSPERM	80	20	100

PRACTICAL

LAB COURSE-I	BASED ON PAPER I&III	80	20	100
LAB COURSE-II	BASED ON PAPER II&IV	80	20	100
	TOTAL MARKS (Theory and Practical)			**600**

M.Sc. II SEMESTER, BOTANY
THEORY

PAPER	TITLE	MAX. MARKS	Internal Assessment /Seminar	Total marks
I	TAXONOMY AND DIVERSITY OF PLANTS	80	20	100
II	MOLECULAR BIOLOGY	80	20	100
III	PLANT PHYSIOLOGY	80	20	100
IV	PLANT METABOLISM	80	20	100

Choice Based Credit System: Semester II **Course Forestry seed Technology.**
Marks 100 , Credit Points -03, Total Hours -50

PRACTICAL

LAB COURSE-I	BASED ON PAPER I&II	80	20	100
LAB COURSE-II	BASED ON PAPER III&IV	80	20	100

	TOTAL MARKS (Theory and Practical)	**600**

TOTAL MARKS OF SEMESTER I&II- 1200

NOTE : Botanical excursion (within or outside Chhattisgarh) is compulsory for the Students of M.Sc.

PRACTICAL SCHEME, LAB COURSE- I
M.Sc. I SEMESTER (BOTANY)

Time-5Hours **Maximum Marks80**

1.	Exercise based on Cytology	15 Marks
2.	Exercise based on Phycology + Microbiology	20 Marks
3	Exercise based on Mycology	15 Marks
4.	Spotting	20 Marks
5.	Viva-voce	10 Marks
6.	Sessional (Internal Assessment)	20 Marks

Total- 100 Marks

PRACTICAL SCHEME, LAB COURSE-II
M.Sc. I SEMESTER (BOTANY)

Time-5Hours **Maximum Marks80**

1.	Exercise based on Genetics	10Marks
2.	Exercise based on Bryophyta	10Marks
3.	Exercise based on Pteridophyta	15Marks
4.	Exercise based on Gymnosperm	15Marks
5.	Spotting	20Marks
6.	Viva-voce	10Marks
7.	Sessional(Internal Assessment)	20Marks

Total- 100 Mark

PRACTICAL SCHEME, LAB COURSE- I
M.Sc. II SEMESTER (BOTANY)

Time-5Hours **Maximum Marks 80**

1.	Exercise based on Molecular biology	15 Marks
2.	Exercise based on plant description (2 plants)	35 Marks
3.	Spotting	20 Marks
4.	Viva-voce	10 Marks
5.	Sessional(Internal Assessment)	20 Marks

Total- 100 Marks

PRACTICAL SCHEME, LAB COURSE-II
M.Sc. II SEMESTER (BOTANY)

Time-5Hours **Maximum Marks80**

1.	Exercise based on Paper-III	25 Marks
2.	Exercise based on Paper-IV	25 Marks
3.	Spotting	20 Marks
4.	Viva-voce	10 Marks
5.	Sessional(Internal Assessment)	20 Marks

Total- 100 Marks

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M.Sc. SEMESTER - I

PAPER - I
CYTOLOGY

MAX.MARKS-80

UNIT-I

- The dynamic cells, Structural organization of the plant cell, specialized plant cell types, chemical foundation, biochemical energetics.
- Cell wall - Structure and functions, biogenesis and growth.
- Plasma membrane; structure, models and functions, site for ATPase, ion carriers' channels and pumps, receptors.

UNIT-II

- Chloroplast-structure, genome organization, gene expression, RNA editing.
- Mitochondria; structure, genome organization, biogenesis.
- Plant Vacuole - Tonoplast membrane, ATPases transporters as a storage organelle.

UNIT-III

- Nucleus: Structure, nuclear pore, Nucleosome organization.
- Ribosome- Structure and functional significance.
- Cell cycle and Apoptosis; Control mechanisms, role of cyclin dependent kinases.
- Amitosis, mitosis and meiosis, karyokinesis and cytokinesis and cell plate formation, mechanisms of programmed cell death (PCD).

UNIT-IV

- Other cell organelles: Structure and functions of microbodies, microtubules, microfilaments, Golgi apparatus, lysosome, endoplasmic reticulum.

- Techniques in cell biology: Immune techniques, in situ hybridization to locate transcripts in cell types

- Electron microscope, camera lucida, micrometry- stage and ocular micrometer

LIST OF PRACTICALS

- Identification of different stages of mitosis from suitable plant material. (onion root tips, garlic root tips).
- Identification of meiosis from suitable plant material. (Onion floral buds).
- Microtomy of bud and root
- Isolation of cell organelles: Mitochondria, Chloroplast, Nucleus, Lysosomes and their assay by succinate dehydrogenase activity (Mitochondria), acid phosphatase activity (Lysosome), acetocarmine staining (Nucleus) and microscopic observation (Chloroplast).
- Study of mitotic index from suitable plant material.
- Study of cyclosis(rotation/circulation) in cells of suitable plant material.
- Preparation of stain and its uses: Acetocarmine, acetoorcein, safranine, iodine, cotton blue, fast green, lactophenol, xylol, egg albumen, euperol etc.

Suggested Reading:-

1. De Robertis and De Robertis 2005 (Eight edition) (Indian) Cell and MolecularBiology, Lippincott Williams, Philadelphia. [B.I Publications Pvt. Ltd. NewDelhi].
2. Sad ova David – 2004 (First Indian Edition). Cell Biology, NewDelhi.
3. Albert Etal 2002 (Fourth Edition). Molecular Biology of the cell, Garland Science(Iaylar and Francis) New York Group(wt.)
4. Lodish Etal 2004 (Fifth Edition). Molecular Cell Biology, W H Freeman andcompany, NewYork.
5. Giese Arthur 1979 (Fifth Edition). Cell Physiology, Toppan company Ltd., Tokyo,Japan.
6. Cooper G.M and Hausman R.E 2007 (Fourth Edition). The Cell molecularapproach Sinauer associate, Inc, Suderland(USA).
7. Powar C.B 2005 (Third Edition). Cell Biology, Himalaya Publishing,Mumbai.
8. Roy S.C and KKDe 2005 (Second Edition). Cell Biology, New central Book AgencyPrivate Ltd.,Kolkata.
9. Krishnamurthy, K.V 2000. Methods in Cell Wall Cytochemistry. CRC Press, Boca Raton, Florida.
10. Buchanan B.B, Gruissm W. and Jones R.L 2000. Biochemistry and Molecular Biologyof Plant. American Society of Plant Physiologist, Maryland,USA.
11.. De D.N 2000. Plant Cell Vacuoles : An Introduction. CISRO Publication, Collingwood, Australia.
12. Kleinsmith L.J and Kish V.M 1995. Principles of Cell and Molecular Biology (Second Edition). Happer Collins College Publishers, New York,USA.
13. Lodish H., Berk A., Zipursky, S.L Matsudaira P., Baltimore D. and Darnell J. 2000. Molecular Cell Biology (Fourth Edition). W.H. Freeman and Company, NewUSA.
14. David Freifelder 1996. Essentials of Molecular Biology, Panima PublishingCompany
15. Gerald Karp 1999 Cell and Molecular Biology- Concept and Expts. John Wiley and Scne Ine.,USA

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PAPER - II

GENETICS

MAX.MARKS-80

UNIT-I

- Chromatin Organization **:** Chromosome structure and packaging of DNA, molecular organization of centromere and telomere, nucleolus and ribosomal RNA genes, chromatin and heterochromatin, Karyotype and idiogram, banding pattern, specialized types of chromosomes; polytene, lamp brush, ß chromosomes and sex chromosomes.

UNIT-II

- Mapping of Bacteriophage genome, Phage phenotype, recombination in phage, genetic transformation and transduction in bacteria.

- Molecular basis of chromosome pairing, chromosomal aberration and polyploidy.

UNIT-III

- Genetic recombination & genetic mapping; Mechanism of crossing over, molecular mechanism of recombination, role of enzymes in recombination, site specific recombination, linkage, linkage group, genetic marker.
- Tetrad analysis in *Neurospora crassa*

UNIT-IV

- Plant breeding technique: Introduction, selection (pure line, mass, bulk),emasculation, bagging, tagging, hybridization (self / cross), mutation, resistant and susceptible, heterosis, inbreeding depression, chimera
- Alien gene transfer through chromosome manipulation; Transfer of whole genome examples from Wheat, *Arachis* & *Brassica*. Transfer of individual chromosomes & chromosome segment, methods for detecting alien chromatin production.

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LIST OF PRACTICALS-

- Staining of salivary gland chromosomes of Chironomas larva or Drosophila.
- Isolation of DNA and its quantification by UV- spectrophotometric method.
- Isolation of RNA and its quantification by UV- spectrophotometric method.
- Detection of DNA by Agarose gel electrophoresis.
- Transformation in Bacteria
- Transduction in Bacteria.
- Biometry : mean, median, mode, chi square test, t test
- Mendelian ratios and gene interaction- monohybrid, dihybrid, complete dominance and incomplete dominance, qualitative and quantitative gene interaction, lethal gene, multiple allelism (ratios 9:3:3:1, 12:3:1, 15:1, 9:3:4,9:7, 9:6:1,13:3, 1:4:6:4:1 etc.)
- Reciprocal translocation in *Tradescantia* and *Rhaeo*

Suggested Readings:

1. Albert B. Bray, D Lewis, J Raff, M. Robert, K. and Walter 1989, Molecular Biology of the Cell (Second Edition) Garland Publishing Inc, NewYork.
2. Atherly, A.G., Girton, J.R. and McDonald, J.F 1999. The Science ofGenetics Saunders College Publishing, Frot Worth,USA.
3. Burnham, C.R 1962. Discussions in Cytogenetics. Burgess Publishing Co. Minnesota.
4. Busch, H. and Rothblum. L 1982. Volume X. The Cell Nucleus rDNA partA. AcademicPress.
5. Hartk D.L and Jones, E.W 1998 Genetics: Principles and Analysis (Fourth Edition). Jones and Bartlett Publishers, Massachusetts,USA.
6. Khush, G.S 1973. Cytogenetics of Aneuploids. Academic Press, NewYork, London.
7. Karp, G. 1999. Cell and Molecular Biology : Concept and Experiments. John Wiley and Sons, Inc.,USA.
8. Lewin, B. 2000. Gene VII. Oxford University Press, New York,USA.
9. Lewis, R. 1997. Human Genetics : Concepts and Application (SecondEdition). WCB McGraw Hill,USA.
10. Malacinski, G.M and Freifelder, D. 1998 : Essentials of Molecular Biology (Third Edition). Jones and B. Artlet Publisher, Inc.,London.
11. Russel, P.J. 1998. Genetics (Fifth Edition). The Benjamin/Cummings Publishing Company IND.,USA.
12. Snustad, D.P and Simmons, M.J 2000. Principles of Genetics (Second Edition). John Wiley and Sons Inc.,USA.
13. Gardner and Simmons Snustad 2005 (Eighth Edition). Principles of Genetics, John Wiley and Sons,Singapore.
14. Sariu C 2004 (Sixth Edition) Genetics. TATA McGraw-Hill Publishing Company Ltd., NewDelhi.

15. Ahluwalia K.B 2005 (First Edition). Genetics. New Age International Private Ltd. Publishers, NewDelhi.
16. Burus and Bottino 1989. (Sixth Edition). The Science of Genetics. Macmillan Publishing Company, New York(USA).
17. Pawar C.B 2003 (First Edition). Genetics Vol. I and II. HimalayaPublishing House,Mumbai.
18. Strickberger 2005. (Third Edition). Genetics. Prentice Hall of India Pvt.Ltd., NewDelhi.
19. Verma and Agarwal, Genetics, S. Chand Co, NewDelhi..
20. Singh B.D 2004. Genetics. Kalyani Publication,Ludhiana.
21. Gupta P.K Genetics and Cytogenetics, Rastogi Publications.

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PAPER – III
MICROBIOLOGY, PHYCOLOGY AND MYCOLOGY

MAX.MARKS-80

UNIT-I

- **Archaebacteria and Eubacteria** : General account, ultra structure, nutrition and reproduction, biology and economic importance.

- **Cyanobacteria:** Salient feature and biological importance.

UNIT-II

- **Viruses:** Characteristics and ultra-structure of virions, isolation and purification of viruses, chemical nature, replication, transmission of viruses, economic importance,Prions, viroids (PSTV), virusoids.

- **Phytoplasma and Mycoplasma:** General characteristic and role in causing plant diseases.

UNIT-III

- **Phycology :** Algae in diversified habitats (terrestrial, freshwater, marine, parasite, symbiotic, epiphytic,endophytic, endozoic), thallus organization, cell ultra-structure, reproduction (vegetative, asexual,sexual).

- Criteria for classification of Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta.
- Economic importance of algae.
- Pigmentation in algae
- Perennation in algae
- Evolution and development of sex in algae

UNIT-IV

- **Mycology :** General characters of fungi, substrate relationship in fungi, cell structure unicellular and multicellular organization, cell wall composition, nutrition (saprobic biotrophic, symbiotic) reproduction, (vegetative, asexual, sexual) heterothallism, heterokaryosis, Para sexuality, recent account of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina, fungi as biocontrol agent, economic importance of fungi.
- **Mycorrhiza:** VAM fungus

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LIST OF PRACTICALS

ALGAE: -

a. Cyanophyta: - Range of thallus organization and reproductive structures, types showing unicellular, colonial , trichome, filamentous, branched (pseudo and true branched).

b. Chlorophyta: - *Chlamydomonas, Pandorina, Eudorina, Volvox, Chlorella, Pediastrum, Hydrodictyon, Scenedesmus, Ulothrix, Cladophora, Draparnaldia, Draparnaldiopsis, Fristschiella, Chara, Nitella, Coleochaete, Ulva,, Caulerpa, Oedogonium, Zygnema, Spirogyra,.*

c. Phaeophyta: -*Ectocarpus, , Dictyota, Laminaria, Fucus, Sargassum.*

d. Rhodophyta: -*Porphyra, Batrachospermum, Gelidium, Gracillaria,Champia,Polysiphonia.*

FUNGI: -

Thallus organization, Spore producing organs, Tissue differentiation and accessory structures of following –

a. Mastigomycotina: - *Synchytrium ,Saprolegnia, Achlya, Peronospora, Plasmopora,Albugo, Sclerospora.*

b. Zygomycotina: -*Mucor, Rhizopus,Pilobolus.*

c. Ascomycotina: - *Yeast, Penicillium, Claviceps, Xylaria, Trichoderma, Taphrina, Protomyces, Eurotium, Erysiphe, Phyllactinia, Uncinula.*

d. Basidiomycotina: -*Uromyces, Ravenelia, Monosporidium,Puccinia, Melampsora,Ustilago, Agaricus, Pleurotus, Ganoderma,Polyporus, Cyathus, Lycoperdon, Geaster.*

e. Deuteromycotina: - *Aspergillus, Fusarium, Cercospora, Colletotrichum, Alternaria, Curvularia, Cladosporium*

Suggested Readings : -

1. Alexopoulus C.J , Mims C.W. and Blackwel M.I 1996. Introductory Mycology. John Wiley and SonsInc.
2. Kumar H.D. 1988. Introductory Phycology. Affiliated East-West Press Ltd., NewDelhi.
3. Mehrotra R.S and Aneja R.S 1998. An introduction to Mycology. New Age Intermediate Press.
4. Rangaswamy G. and Mahadevan A. 1999. Diseases of crop plants in India(Fourth Edition) Prentice Hall of India Pvt. Ltd. NewDelhi.
5. Webster J. 1985. Introduction to Fungi. Cambridge UniversityPress.
6. Hawker L.E. 1967. An Introduction to FungiCambridge.
7. Kamat M.N 1959. Hand Book of Mycology, PrakashPublication.
8. Vashista B.R & A.K Sinha 2005. Botany for degree students – Fungi,S.Chands Publication.

9. Vashista B.R & A.K Sinha 2005. Botany for degree students – Bryophta, S.Chands Publication.
10. Ainsnorth G.C 1973. The Fungi Vol IV A, IV B AcademicPress.
11. Bessey 1950. Morphology and Taxonomy of fungi. The BlakistanCo.
12. Burnett J.H. 1968. Fundamentals of Mycology. Edwards ArnoldPublication.
13. Morries I 1986. An Introduction to the Algae. Cambridge University Press,U.K.
14. Round F.E. 1986. The Biology of Algae. Cambridge University Press,Cambridge
15. Vashista B.R & A.K Sinha 2005. Botany for degree students – Algae, S.Chands Publication
15. Vijayraghavan M.R and Bela Bhatia (1997), Red Algae : Structure, ultrastructure and Reproduction, APH publishing Corporations, NewDelhi.
16. Vijayraghavan M.R and Bela Bhatia (1997), Brown Algae : Structure, ultrastructure and Reproduction, APH publishing Corporations, NewDelhi.
17. Fritsch F.E (1945). The structure and reproduction of the algae Volume I andII, Cambridge UniversityPress.
18. Chapman V.J and Chapman D.J (1973). Thje Algae Macmillon and company, NewYork.
19. Bold H.C and Wynne M.J (1975). Introduction to the Algae structure andreproduction prentice hall Biological ScienceSeries.
20. Pandey S.N. A Text-book of Botany Volume I, Vikas Publications.

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PAPER - IV

BRYOPHYTA, PTERIDOPHYTA AND GYMNOSPERM

MAX.MARKS-80

UNIT-I

- **Bryophyta :** morphology, structure, reproduction, life history, distribution, classification.
- General account of Marchantiales, Jungermanniales, Anthocerotales, Sphagnales, Funariales and Polytrichales. Economic and ecological importance.
- Progressive sterilization of sporogenous tissue in bryophytes
- Spore dispersal mechanism in bryophytes
- Thallus organization of bryophytes
- Progressive and reduction theory of origin and development in bryophytes

UNIT-II

- **Pteridophyta:** morphology, anatomy and reproduction, classification,evolution of stele. Telome theory, concept of first vascular plants
- Homospory, Heterospory and origin of seed habit,
- General account of fossil pteridophyta.
- Prothallus organization
- Introduction to Psilopsida, Lycopsida, Sphenopsida and Pteropsida.

UNIT-III

- Gymnosperm: General characters of gymnosperm mentioning diversity.
- Classification of gymnosperm.
- Resemblances and difference amongst gymnosperm, pteridophyta and angiosperm.
- Gymnosperm distribution in India.
- Gymnosperm Biotechnology.
- Economic importance of gymnosperm.
- Structure and theories regarding origin of Paleozoic ovule.

UNIT-IV

- Extinct gymnosperm : general account of pteridospermales, Glossopteridales, Caytoniales,Pentoxylales.
- Extant gymnosperm : Cycadales, Ginkgoales, Coniferales, Ephidedrales Gnetales, and Welwistschiale

LIST OF PRACTICALS

Bryophyta: -

a. Hepaticopsida: - *Ricciocarpus, Riccia, Marchantia, Targionia, Astrella, Porella, Cyathodium, Plagiochasma,*
b. Anthocerotopsida: -*Anthoceros,Notothyllus.*
c. Bryopsida: -*Sphagnum, Funaria,Polytrichum,*
d. Pteridophyta:-

1. Study of the following members to observe arrangement of Sori on a receptacle :- *Isoetes, Osmunda, Angiopteris, Ceratopteris, Achrostichum,Gleichinia*
2. Morphology, Anatomy and reproductive structures of :- *Psilotum, Selaginella, Lycopodium, Equisetum, Ophioglossum, Lygodium, Pteris, Pteridium, Adiantum, Marsilea, Salvinia, Azolla.*

e. Gymnosperms: -

Morphology, Anatomy and reproductive structures of –*Cycas, Zamia, Ginkgo, Pinus, Cryptomeria, Juniperous, Araucaria, Taxus, Cedrus Thuja, Podocarpus, Gnetum, Ephedra.*

monographic study of the members of bryophytes, pteridophytes and gymnosperms

Hand /microtome Double stained permanent slides (DSPS) **preparation of atleast 20 slides** from above genera should be submitted.

Suggested readings:

1. Sporne K.R. 1991. The Morphology of Pteridophytes. B.I Publishing Pvt. Ltd.Bombay.
2. Stewart W.N. and Rathwell G.W. 1993. Paleobotany and the Evolution of plants. Cambridge UniversityPress.
3. Bhatnagar S.P and Moitra Alok 1996. Gymnosperms. New Age International Pvt. Ltd. Publishers, New Delhi, 470pp.
4. Biswas C and Johari B.M 2004. The Gymnosperms Narosa Publishing House, NewDelhi. 497 pp.
5. Sporne K.R 1965. The Morphology of Gymnosperms London, pp.216.
6. Bierhorst D.W. 1971. Morphology of Vascular Plants. New York and London.
7. Chamberlain C.J 1934. Gymnosperms-Structure and Evolution, Chicago.(Page19)
8. Coulter J.M. and Chamberlain C.J. 1917. Morphology of Gymnosperms,Chicago.
9. Foster A.S and Gifford E.M 1959. Comparative Morphology of Vascular Plants.San Francisco.
10. Maheshwari P. and Vasil, Vimla 1961. Gnetum,Delhi.
11. Vashishta P.C., A.R. Sinha, Anil Kumar. 2006. Gymnosperms. S.Chand.Publication
12. Vashishta P.C. 2006. Pteridophytes. S.Chand.
13. Parihar N.S. 1996. Biology and Morphology of Pteridophytes. Central BookDepot, Allahabad
14. Parihar N.S. 1991. Bryophyta. Central Book Depot,Allahabad.
15. Puri P. 1980. Bryophytes. Atma Ram and Sons,Delhi.

    Vashista B.R & A.K Sinha 2005. Botany for degree students – Bryophta,S.Chands Publication
16. Sporne. Morphology of Bryophytes, Oxford PublishingHouse
17. Rashid A (1998). An introduction to Bryophyta. First edition, Vikas Publishing House Pvt. Ltd, NewDelhi.

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SEMESETR II
PAPER - I

TAXONOMY AND DIVERSITY OF PLANTS

MAX.MARKS-80

UNIT-I

- Plant nomenclature: Historical background of nomenclature, Binomial Nomenclature, International code of Botanical nomenclature.
- Plant identification: Herbaria, Botanical gardens, Taxonomic literature, Taxonomic- keys.
- Taxonomic hierarchy - Major categories, minor categories, species concept.
- Taxonomic evidences - Morphology, Anatomy, Palynology, Embryology, Cytology, Phytochemistry, Genome analysis and Nucleic acid hybridization.

UNIT-II

- Pre Darwinian Classification Based on form relationship (Benthem and Hooker)
- Post Darwinian classification Engler and Prantl, Bessey's, Hutchinson, Takhtajan and Cronquist.
- Recent modifications : Dahlgren's system of classification.
- Fossil angiosperm.

UNIT-III

- Study of following families with particular reference to systematic position, phylogeny, evolutionary trends and economic importance.
- Polypetalae: Ranunculaceae, Magnoliaceae, Nymphacaceae, Brassicaceae, Sterculiaceae Meliaceae, Moringaceae, Fabaceae, Myritaceae, Cucurbitaceae, Apiaceae (Umbelliferae),
- Gamopetalae:Rubiaceae, Asteraceae, Sapotaceae. Oleaceae, Asclepiadaceae, Solanaceae, Bignoniaceae, Verbenaceae, Lamiaceae (Labiatae),

UNIT-IV

- Study of following families with particular reference to systematic position, phylogeny, Evolutionary trends and economic importance,
- **Monochlamydae-** Nyctaginaceae, Amaranthaceae, Polygonaceae,Euphorbiaceae, Moraceae, Casuarinaceae
- **Monocot families-** Orchidaceae, Iridaceae, Amaryllidaceae, Sciteminae (Musaceae) Zingiberaceae, Cannaceae, Liliaceae, Commelinaceae, Palmae (Aracaceae), Araceae, Cyperaceae, Poaceae (Graminae) study of local available familiar plants.

LIST OF PRACTICALS:-

1. Methods of non-destructive field collection and documentation.
2. Techniques of herbaria preparation.
3. Morphological characterization of selected families of dicots and monocots and identification up to families.
4. Preparation of artificial key based on appropriate character combination.
5. Identification of genus and species from Monocots and Dicots.
6. Identification of given plant up to species with the help of modern flora keys.
7. Every student should submit duly prepared atleast 40 herbarium sheets.

Suggested readings: -

1. Blatter E and W.S Millard. 1929. Some Beautiful Indian Trees J.Bom. Nat Hist Soc.33:624-635.
2. Bor N.L 1943. Manual of Indian Forest Botany.London.
3. Cliford H.T and W. Stephenson. 1975. An Introduction to NumericalTaxonomy. Academic Press,N.Y.
4. Cole A.J (Ed.) 1969. Numerical Taxonomy. AcademicPress,N.Y.
5. Cronquist, A. 1968. The Evolution and Classification of Flowering Plants. Thomas Nel and Sons, Ltd.London.
6. Davis P.H and V.H Heywood 1963. Principles of Angiosperm Taxonomy. Oliver and Boyd London.
7. Heywood V.H 1967. Plant Taxonomy,London.
8. Lawrence, G.H.M 1951. Taxonomy of Vascular Plants.N.Y.
9. Lawrence G.H.M 1955. An Introduction to Plant TaxonomyN.Y.
10. Rendle A.B. 1925. The Classification of flowering plants. 2 Vols.London.
11. Santapau H. 1953. The Flora of Khandala on the Western Ghats ofIndia.
12. Singh V. and D.K Jain, 1981 Taxonomy of Angiosperms. Rastogi Publication,Meerut.
13. Swingle D.B. 1946. A Text book of Systematic Botany. Mc Graw Hill Book Co. NewYork.
14. Pande B.P 1997. Taxonomy of Angiosperms. S.Chand Publication.
15. Takhtajan A. 1969. Flowering Plants; Origin and Dispo

M.Sc. Botany
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PAPER – II

MOLECULAR BIOLOGY

MAX. MARKS-80

UNIT-I

- RNA and DNA Structure. A, B, C and Z Forms of DNA, HnRNA, mRNA, tRNA, rRNA, exon, intron, split gene, junk DNA
- DNA replication , damage and repair

UNIT-II

- Transcription, translation in prokaryotes and eukaryotes
- Molecular Cytogenetics **:** Nuclear DNA content, C-value paradox, Cot curve and its Significance,
- Restriction mapping - concept and techniques,
- Multigene families and their evolution,

UNIT-III

- Gene structure and expression: fine structure of gene, Cis-trans test, fine structure analysis of eukaryotes, introns and their significance. RNA splicing, regulation of gene expression in prokaryotes and eukaryotes.
- Protein sorting: Targeting of proteins to organelles.

UNIT-IV

- Mutation: Spontaneous and induced mutation, physical and chemical mutagens molecular basis of gene, transposable elements in prokaryotes and eukaryotes mutation induced by transposones, site directed mutagenesis Inherited human diseases and defects in DNA repair, translocation, intersect Robertsonian translocation, B-Atranslocation.

PRACTICALS:

1. Study of structure different types of DNA and RNA
2. Formation and significance of chromosomal bridge, micronuclei, legard, acentric and dicentric due to Chromosomal aberrations
3. Physical and chemical mutagens and its role
4. Symptoms and inheritance pattern of genetic human diseases- sickle cell anaemia , thallasemia, alkaptunuria, phenylketonuria etc.

Suggested Readings:

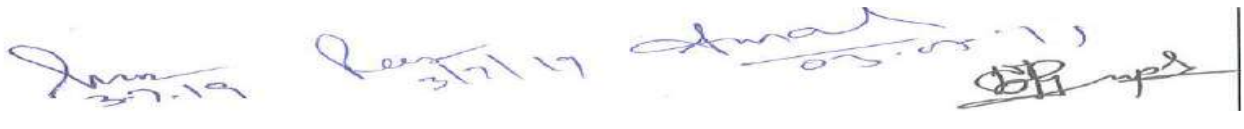
1. Albert B. Bray, D Lewis, J Raff, M. Robert, K. and Walter 1989, Molecular Biology of the Cell (Second Edition) Garland Publishing Inc, NewYork.
2. Atherly, A.G., Girton, J.R. and McDonald, J.F 1999. The Science of Genetics Saunders College Publishing, Frot Worth,USA.
3. Burnham, C.R 1962. Discussions in Cytogenetics. Burgess Publishing Co. Minnesota.
4. Busch, H. and Rothblum. L 1982. Volume X. The Cell Nucleus rDNA partA. AcademicPress.
5. Hartk D.L and Jones, E.W 1998 Genetics: Principles and Analysis (Fourth Edition). Jones and Bartlett Publishers, Massachusetts,USA.
6. Khush, G.S 1973. Cytogenetics of Aneuploids. Academic Press, NewYork, London.

7 . Karp, G. 1999. Cell and Molecular Biology : Concept and Experiments. John Wiley and Sons, Inc., USA.

8. Lewin, B. 2000. Gene VII. Oxford University Press, New York,USA.
9. Lewis, R. 1997. Human Genetics : Concepts and Application (SecondEdition). WCB McGraw Hill,USA.

10 . Malacinski, G.M and Freifelder, D. 1998 : Essentials of Molecular Biology (Third Edition). Jones and B. Artlet Publisher, Inc., London.

11. Russel, P.J. 1998. Genetics (Fifth Edition). The Benjamin/Cummings Publishing Company IND.,USA.
12. Snustad, D.P and Simmons, M.J 2000. Principles of Genetics (Second Edition). John Wiley and Sons Inc.,USA.
13. Gardner and Simmons Snustad 2005 (Eighth Edition). Principles ofGenetics, John Wiley and Sons,Singapore.
14. Sariu C 2004 (Sixth Edition) Genetics. TATA McGraw-Hill Publishing Company Ltd., NewDelhi.
15. Ahluwalia K.B 2005 (First Edition). Genetics. New Age InternationalPrivate Ltd. Publishers, New Delhi.*(Page12)*
16. Burus and Bottino 1989. (Sixth Edition). The Science of Genetics. Macmillan Publishing Company, New York(USA).
17. Pawar C.B 2003 (First Edition). Genetics Vol. I and II. Himalaya Publishing House,Mumbai.
18. Strickberger 2005. (Third Edition). Genetics. Prentice Hall of India Pvt. Ltd., NewDelhi.
19. Verma and Agarwal, Genetics, S. Chand Co, NewDelhi..
20. Singh B.D 2004. Genetics. Kalyani Publication,Ludhiana.
21. Gupta P.K Genetics and Cytogenetics, Rastogi Publications.



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PAPER - III

PLANT PHYSIOLOGY

MAX. MARKS - 80

UNIT-I

- **Membrane transport and translocation of water and solutes:** Plant-water relation,physical and chemical properties of water, imbibition, osmosis, diffusion, DPD, OP,TP,WP, plasmolysis (Incipient, evident and limited), deplasmolysis, mechanism of water transport through Xylem, root microbe interaction in facilitating nutrient uptake. Comparison of xylem and phloem transport, phloem loading and unloading, passive and active solute transport, membrane transport system.

UNIT-II

- **Signal Transduction :**Overview, receptors and G proteins, Phospholipids signaling, role of C-AMP, calcium-calmodulin cascade, diversity in protein kinases and phosphatases, specific signaling mechanism- two component sensor regulatory system in bacteria.

UNIT-III

- **Stress physiology :mineral nutrition in plants (excess and deficiency),**Plant responses to biotic and abiotic stress, mechanism of biotic and abiotic stress tolerance, HR Fundamental and SAR, water deficit and drought resistance, salinity stress, metal toxicity, freezing and heat stress, oxidative stress.

UNIT-IV

- Sensory photobiology, History of discovery of phytochromes and cryptochromes and their photo chemical and biochemical properties, photophysiology of light under responses,cellular localization, and molecular mechanism of action of enzyme.

- The flowering process:- Photoperiodism and its significance, endogeneous clock and its regulation, floral induction and development, Genetic, molecular analysis, role of vernalization.

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LIST OF PRACTICALS (Based on Paper III and IV)

1. Determination of osmotic pressure of cell sap by plasmolytic method.
2. Determination of Diffusion pressure deficit in potato tuber.
3. Determination of imbibition pressure of seeds of different catagories (protein, lipid, carbohydrate containing seeds).
4. To compare the rate of imbibitions of fatty and starchy seeds.
5. Determination of osmotic pressure of cell sap by plasmolytic method.
6. Determination of effect of temperature on the permeability of plasma membrane of beet root.
7. Determination of effect of different organic solvents (alcohol, formaline, benzene) on the permeability of plasma membrane of beet root.
8. Determination of effect of different concentration of organic solvents (alcohol, formaline, benzene) on the permeability of plasma membrane of beet root.
9. Determination of effect of different Phytohormones on the germination of seeds.
10. Determination of effect of different concentration of auxins on the germination of seeds.
11. Determination of the rate of respiration by Ganong's Respirometer.
12. Determination of the rate of respiration by Pipette manometer.
13. Determination of R.Q. of carbohydrates by Ganong's Respirometer.
14. Determination of R.Q. of lipids by Ganong's Respirometer.
15. Determination of R.Q. of proteins by Ganong's Respirometer.
16. Separation of chlorophyll pigments by paper chromatography.
17. Separation of chlorophyll pigments by circular paper chromatography.
18. Qualitative analysis of Organic acids by paper chromatography.
19. Qualitative analysis of amino acids by paper chromatography.
20. Qualitative analysis of sugars by paper chromatography.
21. Separation of A.A by thin layer chromatography method.
22. Separation of chlorophyll by thin layer chromatography.
23. Determination of the effect of CO_2 concentration on the rate of photosynthesis by inverted funnel method.
24. Determination of the effect of CO_2 concentration on the rate of photosynthesis by Wilmot's bubbler.
25. Determination of the effect of intensity of light on the rate of photosynthesis by Wilmot's bubbler.
26. Determination of the effect of intensity of light on the rate of photosynthesis by inverted funnel method.
27. Determination of the effect of quality of light on the rate of photosynthesis by inverted funnel method.
28. Determination of the effect of quality of light on the rate of photosynthesis by Wilmot's bubbler.

MINOR EXPERIMENTS

1 Preparation of molar and molal solutions.
2 Preparation of percentagesolution.
3 Preparation of normal solution ofsolute.
4 Preparation of normal solution of acid andbase.
5 Demonstration of Brownian movement in the latex ofCalotropis.
6 Demonstration of tyndalleffect.
7 Demonstration of plasmolysis and deplasmolysis in plantcell.
8 Demonstration of exosmosis and endosmosis in grapes andresins.
9 Demonstration of the rate of respiration of flower buds by pipettemano-meter.
10 Demonstration of evolution of O_2 during photosynthesis by inverted funnel method.
11 Demonstration of the rate of photosynthesis by inverted funnel method.
12 Demonstration of the rate of photosynthesis by Wilmot's bubbler.
13 Determination of the effect of temperature on the rate of photosynthesis by inverted funnel method.
14 Demonstration of the rise of temperature during seed germination.
15 Demonstration of evolution of CO_2 during respiration.
16 Demonstration of fermentation by Kuhns tube.
17 Demonstration of Determination of R.Q. of organic acids by Ganong's Respirometer.
18 Effect of phytohormones on the growth of seedling.

Suggested Reading :-

1. Moore T.C. 1989. Biochemistry and Physiology of Plant Hormones Springer–Verlag, New York,USA.
2. Nobel P.S 1999. Physiochemical and Environmental Plant Physiology(Second Edition) Academic Press, San Diego,USA.
3. Salibury F.B and Ross C.W 1992. Plant physiology (Fourth Edition)Wadsworth Publishing Company,California,USA.
4. Singhal G.S., Renger G., Sopory, S.K. Irrgang K.D and Govindjee1999. Concept in Photobiology; Photosynthesis and Photomorphogenesis.Narosa Publishing House, New Delhi.
5. Taiz L. and Zeiger E. 1998. Plant Physiology (Second Edition). Sinauer Associates, Inc. Publishes, Massachusetts,USA.
6. Thomas B. and Vince-Prue D. 1997. Photoperiodism in Plants (Second Edition) Academic Press, San Diego,USA.
7. Verma S.K. and Verma Mohit 2007. A.T.B of Plant Physiology, Biochemistry and Biotechnology, S.Chand Publications.
8. Lehninger A.C 1987. Principles of Biochmistry, CBS Publishers and Distributers (Indian Reprint)

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PAPER - IV

PLANT METABOLISM

MAX.MARKS-80

UNIT-I

- **Photosynthesis :** General concepts and historical background, evolution of photosynthetic apparatus, photosynthetic pigments and light harvesting complexes, photo oxidation of water, mechanism of electron and proton transport, Carbon assimilation ,the Calvin cycle, photorespiration and its significance, the C_4 cycle, the CAM pathway, biosynthesis of starch and sucrose, physiological and ecological considerations.

UNIT-II

- **Respiration and lipid metabolism :** Overview of plant respiration, aerobic and anaerobic, glycolysis, Fermentation, Krebs' cycle (TCA cycle), electron transport and ATP synthesis, Pentose phosphate pathway, alternative oxidative system, structure and function of lipids, fatty acid biosynthesis, synthesis of membrane lipids ,structural lipids and storage lipids and their catabolism, Glyoxylate cycle.

UNIT-III

- **Nitrogen and Sulphur metabolism: Overview**, biological nitrogen fixation, nodule formation and nod factors, nif gene, nitrogense, leghaemoglobin, mechanism of nitrate uptake and reduction, ammonium assimilation, sulphur uptake, transport and assimilation.nitrogen cycle, sulphur cycle.

UNIT-IV

- **Plant growth regulators and elicitors :** Physiological effects and mechanism of action of auxins, gibberellins, cytokinins, ethylenes, abscisic acid, brassinosteroid, polymines ,jasmonic acid and salicylic acid, hormone receptors.
- **Movements** in plants-types and its measurement.
- **Fundamentals of enzymology :** Structure and nature of enzymes, inhibitions, General aspects of allosteric mechanism, regulatory & active sites, isozymes, kinetics of enzymatic catalysis, Michaelis-Menton equation and its significance.

*****

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1. Determination of osmotic pressure of cell sap by plasmolytic method.
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3. Determination of imbibitions pressure of seeds of different catagories (protein, lipid, carbohydrate containing seeds).
4. To compare the rate of imbibition of fatty and starchy seeds
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MINOR EXPERIMENTS

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2. Preparation of percentage solution.
3. Preparation of normal solution of solute.
4. Preparation of normal solution of acid and base.
5. Demonstration of Brownian movement in the latex of *Calotropis*.
6. Demonstration of tyndall effect.
7. Demonstration of plasmolysis and deplasmolysis in plant cell.
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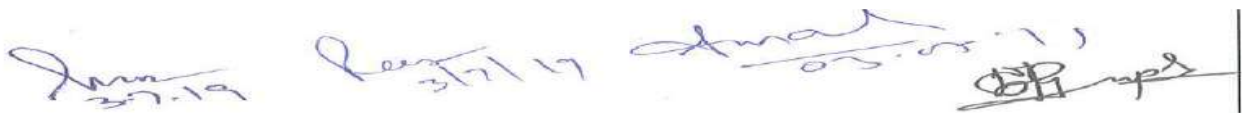
16. Demonstration of fermentation by Kuhns tube.
17. Demonstration of Determination of R.Q. of organic acids by Ganong's Respirometer.
18. Effect of phytohormones on the growth of seedling.

BIOCHEMISTRY PRACTICALS

i. Qualitative estimation of amylase enzyme activity in the germinating seeds of wheat.
ii. Qualitative estimation of amylase enzyme activity in potatotuber.
iii. Qualitative estimation of catalase enzyme activity in the germinating seeds of wheat.
iv. Qualitative estimation of catalase enzyme activity in potato tuber.
v. Effect of enzyme concentration on the rate of catalase enzyme activity in potato tuber.
vi. Effect of enzyme concentration on the rate of catalase enzyme activity in the germinating seeds of wheat.
vii. Effect of enzyme concentration on the rate of amylase enzyme activity in of potato tuber.
viii. Effect of enzyme concentration on the rate of amylase enzyme activity in the germinating seeds of wheat.
ix. Effect of substrate concentration on the rate of catalase enzyme activity in the germinating seeds of wheat.
x. Effect of substrate concentration on the rate of catalase enzyme activity potato tuber.
xi. Effect of substrate concentration on the rate of amylase enzyme activity in the germinating seeds of wheat.

Sussested readings

1. Moore T.C. 1989. Biochemistry and Physiology of Plant Hormones Springer–Verlag, New York,USA.
2. Nobel P.S 1999. Physiochemical and Environmental Plant Physiology (Second Edition) Academic Press, San Diego,USA.
   Salisbury F.B and Ross C.W 1992. Plant physiology (Fourth Edition)Wadsworth Publishing Company, California,USA.
3. Singhal G.S., Renger G., Sopory, S.K. Irrgang K.D and Govindjee1999. Concept in Photobiology; Photosynthesis and Photomorphogenesis.Narosa Publishing House, New Delhi.
4. Taiz L. and Zeiger E. 1998. Plant Physiology (Second Edition). Sinauer Associates, Inc. Publishes, Massachusetts,USA.
5. Thomas B. and Vince-Prue D. 1997. Photoperiodism in Plants (Second Edition) Academic Press, San Diego,USA.
6. Verma S.K. and Verma Mohit 2007. AText Book of Plant Physiology, Biochemistry and Biotechnology, S.Chand Publications.
7. Leninger A.C 1987. Principles of Biochmistry, CBS Publishers and Distributers (Indian Reprint)



SEMESTER EXAMINATION

SCHEME OF EXAMINATION,

M.Sc. III SEMESTER, BOTANY

THEORY

PAPER	TITLE	External Marks	Internal Assessment/ Seminar	Total marks
I	PLANT DEVELOPMENT & PLANT RESOURCES	80	20	100
II	PLANT ECOLOGY – I **(E**cosystem and vegetation ecology)	80	20	100
III	BIOTECHNOLOGY-I (Biotechnology and genetic engineering of plants and microbes)	80	20	100
IV	ELECTIVE- I Molecular plant pathology-I ELECTIVE-2 Limnology - I ELECTIVE-3 Ethno botany – I	80 80 80	20 20 20	100 100 100

PRACTICAL

LAB COURSE-I	BASED ON PAPER I & II	80	20	100
LAB COURSE-II	BASED ON PAPER III & IV	80	20	100
	GRAND TOTAL OF MARKS			600

Choice Based Credit System: Semester III **Course Environmental Science. Marks 100 , Credit Points -03, Total Hours -50**

SCHEME OF EXAMINATION

M.Sc. IV SEMESTER, BOTANY

THEORY

PAPER	TITLE	External / Internal Marks	Assessment Seminar	Total marks
I	PLANT REPRODUCTION AND UTILIZATION OF RESOURCES	80	20	100
II	PLANT ECOLOGY-II (Pollution and biodiversity conservation)	80	20	100
III	BIOTECHNOLOGY-II (Plant cell, tissue culture and organ culture)	80	20	100
IV	ELECTIVE- I Molecular plant pathology-II ELECTIVE-2 Limnology -I I ELECTIVE-3 Ethnobotany - II	80 80 80	20 20 20	100 100 100

PRACTICAL

LAB COURSE-I	BASED ON PAPER I & II	80	20	100
LAB COURSE-II	BASED ON PAPER III & IV	80	20	100
	GRAND TOTAL OF MARKS			600

NOTE:

- Botanical excursion (within or outside Chhattisgarh) is compulsory for the Students of M.Sc.

- In each semester, each theory paper there will be five questions of equal marks. First question will be based on complete syllabus with no internal choice whereas rest question will be unit wise.

PRACTICAL
SCHEME, LAB
COURSE-I
M.Sc. III SEMESTER (BOTANY)

Time-5 Hours **Maximum Marks 100**

1.	Practical based on Paper-I	30 Marks
2.	Practical based on Paper II	25 Marks
3.	Spotting	15 Marks
4.	Viva-voce	10 Marks
5.	Sessional (Internal Assessment)	20 Marks

Total- 100 Marks

PRACTICAL SCHEME, LAB COURSE-II
M.Sc. III SEMESTER (BOTANY)

Time-5 Hours **Maximum Marks 100**

1.	Practical based on Paper-III	25 Marks
2.	Practical based on Paper-IV	30 Marks
3.	Spotting	15 Marks
4.	Viva-voce	10 Marks
5.	Sessional (Internal Assessment)	20 Marks

Total- 100 Marks

PRACTICAL SCHEME,
LAB COURSE-I
M.Sc. IV SEMESTER (BOTANY)

Time-5 Hours **Maximum Marks 100**

1.	Exercise based on Paper-I	25 Marks
2.	Exercise based on Paper-II	25 Marks
3.	Spotting	20 Marks
4.	Viva-voce	10 Marks
5.	Sessional (Internal Assessment)	20 Marks

Total- 100 Marks

PRACTICAL
SCHEME, LAB
COURSE-II
M.Sc. IV SEMESTER (BOTANY)

Time-5 Hours **Maximum Marks 100**

1.	Exercise based on Paper-III	25 Marks
2.	Exercise based on Paper-IV	25 Marks
3.	Spotting	20 Marks
4.	Viva-voce	10 Marks
5.	Sessional (Internal Assessment)	20 Marks

Total- 100 Marks

M.Sc. SEMESTER - III
PAPER - I
PLANT DEVELOPMENT AND PLANT RESOURCES

MAX.MARKS-80

UNIT-I

Introduction: Unique features of plant development. Metabolism of nucleic acids, proteins and mobilization of food reserves, tropisms; control of cell division, Programmed cell death in the life cycle of plants, Seed germination, Hormonal control of Seedling growth. Seed dormancy, Over coming of seed dormancy, Bud dormancy.

Root development : Organization of root apical meristem (RAM), Cell fates and lineages, Vascular tissue differentiation of root, Lateral roots, Root hairs, Root microbe interaction.

UNIT-II

Shoot development : Organization of shoot apical meristem (SAM), Cytological and molecular analysis of SAM. Control of tissue differentiation; especially Xylem and Phloem, Vascular cambium. Secretary ducts and laticifers, Wood development in relation to environmental factors.

UNIT-III

Leaf development : Development, Phyllotaxy, Control of leaf form, Differentiation of epidermis (with special reference to Stomata and Trichome) and Mesophyll cell. Senescence, Influences of hormones and environmental factors on senescence.

Flower development : Floral characteristics, Flower development, Genetics of floral organ differentiation: Homeotic mutant in Arabidopsis and Antirrhinum, Sex determination.

UNIT-IV

Plant resources : Origin, Evolution, Cultivation and Uses of (i) Food, Forage and Fodder crops, (ii) Fiber crops, (iii) Medicinal and Aromatic plants, (iv) Vegetable Oil-yielding crops (v) fruits.

Important fire-wood, Timber-yielding plants and Non-wood forest products (NFPs) such as bamboos, gums, tannins, dyes and resins.

SUGGESTED LABORATORY / FIELD EXERCISES

- Effect of gravity, unilateral light and plant growth regulators on the growth of young seedling.
- Role of dark and red light / far-red light on the expansion of cotyledons and epicotylar hook opening in pea.
- Study of living shoot apices by dissections using aquatic plants such as *Ceratophyllum* and *Hydrilla.*

- Study of monocot and dicot stem.
- Study of cytohistological zonation in the shoot apical meristem (SAM) in sectioned and double-stained permanent slides of a suitable plant such *Coleus, Kalanchoe,* and *Tobacco.* Examinations of shoot apices in monocotyledons in both T.S. and L.S. to show the origin and arrangement of leaf primordial.
- Study of alternate and distichous, alternate and superposed, opposite sand superposed, opposite and decussate leaf arrangement. Examination of rosette plants (*Launaea, Mollugo, Raphanus, Hyoscyamus* etc.) and induction of bolting under natural conditions as well as by GA treatment.
- Microscopic examination of vertical section of leaves such as *Cannabis, Tobacco, Nerium, Maize* and *wheat* to understand the internal structure of leaf tissues and trichomes, glands etc.
- Study the C3 and C4 leaf anatomy of plants.

- Study of epidermal peels of leaves such as *Coccinia, Gailardia, tradescantia, Notonea,* etc. To study the development and final structure of stomata and stomatal index. Demonstration of the effect of ABA on stomatal closure.
- Study of whole roots in monocots and dicots.
- Examination of L.S. of root from a permanent preparation to under stand the organization of root apical meristem and its derivatives. (Use *Maize,* Aerial roots of *Banyan, Pistia, Jussieua* etc.).
- Origin of lateral roots.
- Study of leguminous roots with different types of nodules.
- Food crops: Wheat, Rice, Maize, Chickpea, Potato, Tapioca, Sweet Potato, Sugar cane, Morphology, Anatomy, Micro chemical tests for stored food material.
- Forage/Fodder crops: Study of any five important crops of the locality (For example fodder sorghum, Bajra, Bersem, Clove, Guar bean, Gram, Ficus sp.)
- Plant fibers: (i) Textile fibers: Cotton, Jute, Linen, Sunn hemp, Cannabis. (ii) Cordage fibers; Coir (iii) Fibers for stuffing: Silk and Cotton.

SUGGESTED READINGS :

- Bewley, J.D. and Black. M. 1994 Seeds : Physiology of development and germination. Plenum Press, New Yor.
- Bendre, A. and Kumar, 2004 A. Rastogi pub. Meerut, India.
- Crocker, W. and Barton V.1953 Physiology of seeds. Waltham, Mass, U.S.A
- Santra, S.C., Chatterjee. T.P. and Das, 2005. A.P. College Botany Practical Vol. Li New Central pub. India.
- Parihar, NS. 1964, Hormonal control of plant growth. Asia pub. House, London.
- Wareing P.F. and Phillips I.D.J. 1973, Pergamon press. Oxford.

M.Sc. SEMESTER - III

PAPER - II
PLANT ECOLOGY- I

(ECOSYSTEM AND VEGETATION ECOLOGY)

MAX.MARKS-80

UNIT-I

ECOSYSTEM ORGANISATION:- Structure and functions, primary production (Methods of measurement, global pattern, controlling factors), Energy dynamics (trophic organization, energy flow pathways, ecological efficiencies), Litter fall and decomposition, (mechanism, substrate quality, and climatic factors), global biogeochemical cycles of C, N, P, and S, mineral cycles (pathways, processes and budgets) in terrestrial and aquatic ecosystems.

UNIT-II

ECOSYSTEM STABILITY AND MANAGEMENT

Concept (resistance and resilience), Ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems, ecology of plant invasion, environment impact assessment, ecosystem restorations. Concept of Sustainable development, sustainability indicators.

UNIT-III

VEGETATION ORGANISATION:-

Concepts of community and continuum, analysis of communities (analytical and synthetic characters), Community coefficients, inter specific associations, ordination, and concept of ecological niche.

UNIT-IV

VEGETATION DEVELOPMENT :-

Temporal changes (cyclic and non cyclic), mechanism of ecological succession (relay floristic and initial floristic composition, facilitation, tolerance and inhibition models), change in ecosystem properties during succession.

REFERENCE BOOKS :

Smith, R.L. 1996. Ecology and field biology, Harper Collins, New York.
Odum, E.P. 1971. Fundamentals of Ecology, Saunders, Philadelphia.
Odum, E.P. 1983. Basic ecology, Saunders, Philadelphia.
Kormondy, E.J. 1996. Concepts of Ecology, Prentice Hall of India Pvt.Ltd. New Delhi.
Moldan, B. and Billharz, S. 1997 Sustainability indicators, John Wiley and Sons, New York.

Muller-Dombosis, D and Ellenberg, H 1974 Aims and methods of vegetation ecology, Wiley, New York.
Begon M, Harper, J.L. Townsend, C.R.1996. Ecology, Blackwell science, Cambridge, USA.
Ludwig, J. and Reynolds, J,F, 1988 Statistical ecology, John Wiley and Sons. Barbour, M.G. Burk, J.H. and Pitts, W.D.1987. Terrestrial plant ecology, Benjamin Cummings Publication Company, California.
Chapman, J.L. and Reiss, M.J.1988 Ecology principles and applications,
Cambridge University press, Cambridge, U.K.

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LIST OF PRACTICALS

1. To determine minimum size and number of quadrat required for reliable estimate of biomass in grassland.
2. To compare protected and unprotected grassland stands using community coefficients (similarity indices).
3. To analyze plant communities Bra Curtis ordination method.
4. To estimate IVI of the species in a woodland using point centered quarter method.
5. To calculate mean, variance, standard deviation, standard error, coefficient of variations and to use t test for comparing two means related to ecological data.
6. To find out the relationship between two ecological variables using correlation and regression analysis.
7. To find out important grassland species using chi square test.
8. Scientific visits to a protected area, a wet land, a mangrove, NBPGR, BSI, CSIR, ICAR labs and a recognized botanical gardens or a museum.

REFERENCE BOOKS :

Ludwing, J.A. and Reynolds, J.F. 1988, Stastical Ecology, Willey New York.
Krebs, C.J. Ecological methodology, Herper and Row, New York, USA
Pielou, E.C.1984. The interpretation of ecological data, Wiley, New York.
Moore, P.W. and Chapman, S.B.1986. Methods inplant Ecology, Blackwell scientific publications.
Misra, R. 1968. Ecology work book, Oxford & IBH, New Delhi.
Smith, R.L. 1996. Ecology and Field Biology, Harpercollins, New York.
Muller-Dombois, D and Ellenberg, H. 1974. Aims and methods of vegetation ecology, Wiley, New York.
Sokal, R.R. and Rohlf, F.J. 1995. Biometry, W.H. Freeman & Co. San Francisco.

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M.Sc. SEMESTER - III
PAPER – III
BIOTECHNOLOGY AND GENETIC ENGINEERING OF PLANTS AND MICROBES
MAX.MARKS-80

UNIT-I

BIOTECHNOLOGY - Basic concepts, principles and scope.

RECOMBINANT D.N.A. TECHNOLOGY : Gene cloning principles, Tools - Restriction Endonucleases, DNA modifying enzymes, Choice of Vectors, Plasmid, Cosmid, Bacteriophage vectors, phagmids, Artificial chromosomes. Shuttle vectors, Yeast vectors, Expression vectors and techniques, construction of genomic / cDNA libraries.

UNIT-II

MICROBIAL GENETIC MANIPULATION: Bacterial transformation, selection of recombinants and transformants, genetic improvement of industrial microbes and nitrogen fixers, fermentation technology.

GENETIC ENGINEERING OF PLANTS : Aims, strategies for development of transgenies (with suitable examples), Gene transfer methods - Vector mediated gene transfer-Agrobeacterium the natural genetic engineer. t-DNA mediated DNA transformation. Virus mediated gene transfer, Vectorless or direct DNA transfer.

UNIT-III

DNA SYNTHESIS AND SEQUENCING : Chemical synthesis of gene, Polymerase chain reaction, its variation, application, advantages and limitations, DNA sequencing - Sanger and Coulson method, Maxam Gillbert method, High throughput DNA sequencing, DNA finger printing.

UNIT-IV

GENOMICS AND PROTEOMICS : Genetic and physical mapping of genes, molecular markers for integression of useful traits, Transposon mediated gene tagging, genome projects, bioinformatics, functional genomics, microarrays, protein profiling and its significance.

Suggested Reading :

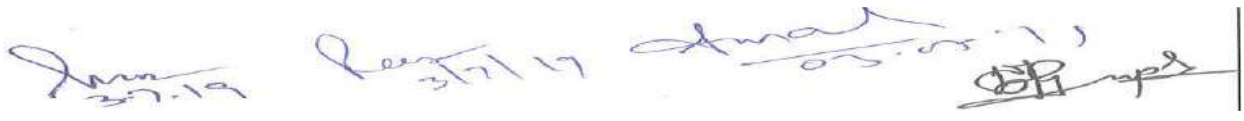
1. Brown, T.A. 1999. Genomes, John Wiley and Sons (Asia) Pvt.Ltd., Singapore.
2. Callow, J.A., Fort-Lloyd, B.V. and Newbury, H.J. 1997.
3. Biotechnology and Plant Genetic Resources : Conservation and Use, CAB International, Oxon, UK.
4. Chrispeels, M.J. and Sadava, 1994, Plants, Genes and Agriculture, Jones & Barlloy Publishers, Boston, USA.
5. Glazer, A.N. and Nikaido, 11, 1995 Microbial Biotechnology. W.H. Freeman & Company, New York, USA.
6. Gustafson, J.P. 2000, Genomes Kluwer Academic Plenum Publishers, New York, USA.
7. Henry, R.J. 1997, Practical Applications of Plant Molecular Biology, Chapman & Hall London, UK/
8. Jolles, O. and Jornvall, H. (eds) 2000. Proteomics in Functional Genomics. Birkhauser Verlag, Bsel, Switzerland.
9. Old, R.W. and Primrose, S.B. 1989, Principal of Gene Manipulation, Blackwell Scientific Publication, Oxford, UK, Primrose, S.B. 1995, Principles of Genome Analysis, Blackwell Science Ltd., Oxford, UK.
10. Raghavan, V. 1997, Molecular Biology of Flowering Plants, Cambridge University Press, New York, USA.
11. Shantharam, S. and Montgomery, J.F. 1999, Biosafety, and Biodiversity, Oxford and IBH Publishing Co. Pvt.Ltd., New Delhi.

Suggested Laboratory Exercises :

1. Growth characteristics of E. coli using plating and turbidimetric methods.
2. Isolation of plasmid from E. coli by alkaline lysis method and its quantitation spectrophotometrically.
3. Restrictiion digestion of the plasmid and estimation of the size of various DNA fragment.
4. Cloning of DNA fragment in a plasmid vector, transformation of the given bacteria population and selection of recombinants.
   Demonstration of DNA sequencing by Sanger's dideoxy method.

Suggested Reading (for laboratory exercise)

1. Plant molecular biology Manual, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherland.
2. Glick, B.R. and Thompson, J.E. 1993. Methods in Plant Molecular Biology and Biotechnology, CRS press, Boca Raton, Florida.
3. Glover, D.M. and Hames, B.D. (Eds), 1995, DNA Cloning 1: A Practical Approach; Core Techniques, 2nd edition, PAS, IRL Press at Oxford University Press, Oxford.
4. Hackett, P.B., Fuchs, J.W. 1988. An introduction to Recombinant DNA Techniques; Basic Experiments in Gene manipulation. The Benjamin Cummings/ Publishing Co.; Inc Menlo, Calio Park, Callifornin.
5. Shaw, C.H. (Ed.) 1988, Plant Molecule Biology: A Practical Approach, IRL Press, Oxford.



M.Sc. SEMESTER - III
PAPER - IV
ELECTIVE COURSE-- MOLECULAR PLANT PATHOLOGY-I

MAX.MARKS-80

UNIT-I

1. Introduction and history of plant pathology.
2. General Principles of plant pathology and classification of plant diseases.
3. **Diseases inciting organisms -** Animate Pathogens- fungi, Bacteria, Mycoplasma, Viruses, Nematodes, their general characteristics, heterotrophic behaviour with emphasis on parasitism ability and virulence.

UNIT-II

1. **Disease Syndrome and General Symptoms of plant diseases :** Pathogenic and nonpathogenic; Symptoms caused by fungi, Bacteria, Viruses, Mycoplasma and Nematodes.
2. **Sources of Infection :** Seeds, soil, water and airborne diseases of plants; Significance of phylosphere and rhizosphere studies.
3. **Pathogenesis -** Dissemination of plant pathogens; Mode of infection; Inoculum potential.

UNIT-III

1. **Effect of environment on disease development-** Predisposing factors; Survival of fungi; Germination of spores; Disease initiation and Epidemics.
2. **Host Parasites relationship -** Mechanism and physiology of infection, Path of infection, Role of enzymes, growth regulators and toxins in pathogenesis.
3. **Physiological specialization :** General account; Physiological specialization with special reference to smuts and rusts.

UNIT-IV

1. **Recurrence of disease** with special reference of recurrence of rust disease in India.
2. **Methods of Studying Plant Diseases:** General account, Macroscopic study, Microscopic study, Koch postulates, Culture technique, Preparation of culture tubes, media preparation, Inoculation, Isolation, Pure culture, Parasitism of obligate parasites, Methods in bacteriology, Techniques required in introductory bacteriology

Suggested Laboratory Exercises:
Experiment based on theory syllabus.

SUGGESTED READINGS :

1. Plant Pathology - J.C. Walkar
2. Fungi and plant diseases - B.B. Mundkar
3. Plant Pathology – G.N. Agrios
4. Plant Pathology - Whecler
5. Plant Pathology (Vol.1-3) – Horsfall & Dimon
6. A text book of Modern Plant Pathology – K.S. Bilgrami and H. S.Dubey
7. Plant Pathology – R.S.singh
8. An introduction to Principles of Plant pathology - R.S.singh
9. Plant Disease of Crop plants in India – N.G. Rangaswamy.
10. Plant Pathology problems and progress- Honfall
11. Essentials of Plant Pathology- V.N. Pathak
12. Plant Pathology – Butter and Jones.
13. Plant Pathology- R.S. Malhotra
14. Crop plant Disease Colender- IARI-India.
15. Physiology of Fungus- – K.S. Bilgrami and H. S.Dubey
16. Micro-organisms in laboratory – G.P. Agarwal and S.K. Hasija.
17. Physiology of fungi – V.G.Lily and H.L.. Barnet.
18. Illustrated Genera of Imperfecti fungi- H.L.. Barnet and.B.B. Hunter.
19. Microbiology and Plant Pathology- P.D.Sharma
20. Plant Pathology- P.D.Sharma
21. Microbiology – P.D.Sharma
22. The Fungi – G. Sumbali
23. Fungicides and crop protection- H.G.Mewitt
24. Fungal diseases of plants- B.M. Duggar
25. Plant Pathology – P.C. Trivedi
26. Plant Pathology – G.P. Gupta
27. Virus and Plant diseases S.R.Mishra
28. Bacterial Diseases- V. Kumar
29. Biotechnology and Plant Pathology- V.K.Jain
30. Laboratory manual of Plant Pathology- D.K.Jha.
31. Modern technology of Plant Pathology- V.Suri.

M.Sc. SEMESTER – III (Botany)
PAPER – IV
ELECTIVE COURSE-- LIMNOLOGY-I
MAX. MARKS-80

UNIT-1

1.Limnology–Definition, historical development and scope of Limnology.

2.The characteristics of water, Hydrological cycle, Global water balance.

3.Types of fresh water habitats and their ecosystem-

(a) Ponds, Streams and rivers. (b) Lakes– General characteristics of lakes and classification of lakes. Definition depth of lakes. Retention and replacement of water in lakes, origin of lakes.

UNIT-II

1.Morphometry–Use of various morphometric parameters and Zonation. Food Chains, Food webs, Trophic levels and Energy flow in freshwater ecosystems. Eutrophication: Causes, mechanism and significance, Management of freshwater bodies.

UNIT-III

Physical Characteristics of Lake water and their role.

1. Light and Temperature-

(a) Transmission and absorption of Light, Colour and Transparency of light

(b) Distribution of heat in lakes, Temperature Radiation, Stratification and Heat Budget. Comparative analysis of river, reservoir and lakes.

2. Water movements: Flow of water, surface and internal water movements. Turbidity, Salinity and Total Dissolved Solids.

UNIT-IV

3. Chemical characteristics of fresh water with special reference to different parameters-Dissolved gases (Oxygen, Carbon di oxide, Hydrogen Sulphide), Seasonal changes in dissolved gases and pH, Hardness, Alkalinity, Sulphates, Nitrogen, Phosphorus, Iron, Sulphur and Silica cycle, Arsenic, and Fluoride.

Suggested Readings:

1. Anathakrishnan : Bioresources Ecology
2. Goldman : Limnology
3. Odum : Ecology
4. Pawlosuske : Physico-chemical methods for water LimnologyWetzal : Chemical and biological methods for water pollution studies
5. Trivedi&Goyal : Chemical and biological methods for water pollution studies
6. Welch : Limnology Vols.I-II
7. Perkins : Ecology
8. Arora : Fundamentals of environmental biology
9. Ghoshe : Toxicology
10. Sood : Toxicology

Suggested Laboratory Exercises

1. Construction of morphometric maps of aquatic systems.
2. Measurement of transparency and temperature.
3. Analysis of different dissolved gases: Dissolved oxygen and Carbon dioxide.
4. Analysis of lake water for bicarbonates, carbonates, total alkalinity, chlorides etc.

M.Sc.(Botany) III SEMESTER

PAPER –IV

Elective Course –Ethno botany

MAX. MARKS: 80

Unit I

- **Ethno botany** : History, general account and its sub disciplines.
- Interdisciplinary approaches & aim of ethno botany.
- Main world centers of Ethno botanical studies, workers & literature of Ethno botany
- Ethno botany with special reference to Chhattisgarh.
- Ethno botanical Research done in India:
- Ethno botany in relation to national priorities and health care programme.
- Practical application of ethno botany for tribal development programme.

Unit II

- Methods and techniques in ethno botany**.**
- General account of major and minor tribes of Chhattisgarh with special reference to Gond ,Kamar ,Baiga , Abujhmaria .
- Ethno botanical aspect of Art & literature.
- Abstract ethno botany with special reference to folklore, Taboos, Majico-religious beliefs.

Unit –III

- Ethno botanical importance of Bacteria, Algae, Fungi, Bryophyte, Pteridophyta and Gymnosperm.
- Ethnovaterinary medicines from plants.
- Major & Minor Forest Products (NWFPs)of Chhattisgarh.
- Ethno botany in relation to livelihood security reference to tribes.

Unit- IV

- Ethnobotanical study of following plants with special reference to their medicinal importance 1. *Azadirachta indica* (Neem) 2. *Emblica officinalis* (Amla) 3. *Ricinus conmunis* (Andi) 4. *Madhuca indica* (Mahuaa) 5. *Cassia fistula* (Amaltash) 6. *Ficus religiosa* (Pipal) 7. *Oscimumsanctum* (Tulsi) 8. *Asparagus racemosus* (Satavar) 9. *Aloe vera* (Ghrit kumari) 10. *Andographis paniculata* (Bhui neem).

Suggested Readings:-

- Baker, H.G. 1978. Plants and Civilization (3 rd edition). C.A. Wadsworth, Belmont.
- Chandel, K.P.S., Shukla, G.& Sharma, N. 1996. Biodiversity in medicinal and Aromatic Plants in India: Conservation & Utilization. National Bureau of Plant Genetic Resources, New Delhi.
- Chrispeels, M.J. & Sadava, D. 1977. Plants , Food & People. W.H Freeman and Co., San Francisco.
- Ambasta S.P. (ed.) (1986). The Useful Plants of India. Publications & Information Direxторate, CSIR, New Delhi India.
- Anon. (1978). The tribes of Madhya Pradesh. Dept. of Tribal Welfare, Govt. of M.P. Bhopal.
- Arnold. J. E. M. & Ruiz Perez, M, (1998). The role of non-timber forest products in conservation and development. In: Wallenberg, Eva. & Andrew Ingles (Eds.) Income from the Forest, CIFOR 1998, Indonesia, pp-17 to 41.
- Asolkar, L.V. (1992). Second Supplement to Glossary of Medicinal Plants, (CSIR) NISCOM, New Delhi, India.
- Bal, S.N. (1984). Catalogue of Medicinal Plant Exhibits. BSI. Bishne Singh Mahendra Pal Singh, Cannaught Place, Dehra Dun, India.
- Buch, M.N. (1991). Forest of Madhya Pradesh, Madhya Pradesh Madhyam Bhopal.
- Chopra, R.N.; Badhwar, R.L. & Ghosh, S. (1965). Poisonous Plants of India. Vol. I. 2nd Ed. ICAR, New Delhi, India.
- Cotton C.M, (1996). Ethnobotany: Principals and Applications, John Willey & Sons, Chichester. New York.
- Faulks. P.J. (1958) An Introduction to Ethnobotany: Moredale Publications Ltd. London, England.
- Harshberger, J.W. (1896). Purposes of Ethnobotany Bot. Gaz. 21: 146-154.
- Jain S.K. and Phuipps, R.D. (1991). Medicinal Plants of India Rec. Pub.Algonac USA 2Vols. 1-849.
- Jain, S. K. (1991). Dictionary of India folk medicine and Ethnobotany. Deep publications. NEW DELHI, pp. 1-311.
- Jain, S. K. (1995). In Manual of Ethnobotany (edt. S.K. Jain,) Scientific Pubisher, Jodhpur. 128-134.
- Jain, S.K. & Rao, R.R. (1977). A handbook off field and herbarium methods. New Delhi: Today & Tomorrow's Printers and Publishers.
- Jain, S.K. (1981). Glimpses of Indian Ethnobotany. Oxford & IBH New Delhi, India.
- Jain, S.K. (1989). Methods and Approaches in Ethnobotany. Society of Ethnobotanist. Lucknow.
- Jain, S.K. and Mudgal, Hand Book of Ethanobotany. Bisen pal Singhm Mahendra Pal Singh Publication.
- Vaishnaw T.K. (2004). Chhattisgarh ki Anusuchit Janjatiyan, Adim Jati Anusandhan Avam Prshikshan Sansthan Raipur. Prakashan kramank 2, pp. 1-120

- Varghese, E. S. V D. (1996). Applied Ethnobotany - A case study among the Kharias of Central India. New Delhi. Deep Publications
- Jajoria, E, V.K. (1998); "The Kamar [A way of life.] Vanya Prakashan., Tribal Research and Development Institute. 35, Shamla Hills, Bhopal., ethnobot. Res.2:303-3 15.
- Joshi, S.G. (2000). Medicinal Plants, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, India.
- Kirtikar, K. R. & Basu, B.D. (1933-1935). Indian Medicinal plants. Vol.I to VIII (4 Vols. text & 4 vols. plates) Reprint 1994, Dehradun U.P.
- Maheshwari, J.K. Ed. (2000). Ethnobotany and Medicinal Plants of Indian Subcontinent. Scientific Publishers, Jodhpur
- Martin, G.J. (1995). Ethnobotany. Chapman and Hall, London.

Suggested Laboratory Exercises:-

1. Description and identification of medicinal plants and its medical properties.
2. Preparation of medicinal plants herbarium and photographs.
3. Herbal preparation:-
    a. Extract of Tulsi leaves.
    b. Ointment from Neem Leaves.
    c. Ayurvedic tooth powder.
    d. Face pack preparation from various herbs.
    e. Preparation of Triphla.
    f. Kwath of Triphla.
    g. Preparation of diabeties controlled powder.
    h. Preparation ofherbal shampoo.
4. To cultivate at least two medicinal plant in earthen pot.
5. Field Study of Forest area or Tribal area.
6. Documentation technique of Ethnobotanical knowledge.
7. To separate active principles from the extract of Medicinal plant.

M.Sc. SEMESTER - IV

PAPER - I
PLANT REPRODUCTION AND UTILIZATION OF RESOURCES
MAX.MARKS-80

UNIT-I

Reproduction : Vegetative reparation, Methods of propagation. Pollination, Pollination- mechanism and vector, Structure of pistil, Pollen stigma interaction, Sporophytic and gametophytic Self-incompatibility (Cytological, biochemical and molecular aspects), Fertilization, double fertilization, *in-vitro* fertilization.

UNIT-II

Male gametophyte : Structure of anther, Microsporogenesis, Role of tapetum, pollen development, male sterility, sperm dimorphism and hybrid seed production, Pollen germination, Pollen tube growth and guidance, Pollen storage, Pollen allergy, Pollen embryo sac.

Female gametophyte : Ovule development, Organization of embryo sac and Structure of embryo sac cells.

UNIT-III

Seed and Fruit development: Endosperm development during early, maturation and desiccation stages. Embryo genesis, Storage proteins of endosperm, Ultra structure and nuclear cytology, Cell lineage during late embryo development, Polyembryony, Apomixes, Embryo culture, Endospermic and non-endospermic seeds, Dynamics of fruit growth, biochemistry and biology of fruit maturation.

UNIT-IV

Utilization of resources: Plant used as avenue trees for shade, Pollution control and aesthetics, Innovation for meeting world food demands Origin of Agriculture. Green revolution; benefits and adverse consequences. Ethanobotanically important plants of Chhattisgarh. World centers of primary diversity of domesticated plants.

SUGGESTED READINGS :

- Bhojwani, SS. and Bhatnagar, S.P. 2000. The Embryology of Angiosperms (4 revised and enlarged edition) Vikas publication House, New Delhi.
- Fageri, K. and Vander Pijl, L. 1979. The Principles of Pollination Ecology Pergamon Press, Oxford.
- Proctor, And Yeo, P. 1973. The Pollination of Flowers. William Collins, London.
- Raghavan. V. 1997. Molecular Embryology of Flowering Plants. Cambridge University, Press, Cambridge.

- Raghavan, V. 1999 Developmental Biology of Flowering Plants. Springer-Verlag, New York.
- Raven, P.H. Evert, R.F. and Eichhorn, and S.E. 1992. Biology of plants (5 edition), Worth, New York.
- Sedgely, M. and Griffin, A.R. 1989. Sexual Reproduction of Tree Crops. Academic Press, London.
- Shivanna, K.R. and Sawhney, V.K. 1997. Pollen Biotechnology for crop Production and Improvement.
- Shivanna, K.R. and Rangaswamy, N.S. 1992. Pollen Biology : A Laboratory Manual. Springer-Verlag, Berlin.
- Shivanna, K.R. and Johri, B.M. 1985. The Angiosperm Pollen : Structure and Function. Wiley Eastern Ltd., New York.
- Chandel, K.P.S., Shukla, G. and Sharma N. 1996. Biodiversity in Medicinal and Aromatic Plants in India; Conservation and Utilization. National Bureau of Plant Genetic Resources, New Delhi.
- Chrispeels, M.J. and Sdava, D. 1977. Plants, Food and People. W.H. Freeman and CO., San Francisco.
- Council of Scientific and Industrial Research 1986. The Useful Plants of India. Publications and directorate, CSIR, New Delhi.
- Kochhar, S.L. 1998. Economic botany of the Tropics, 2nd edition. Macmillan India Ltd., Delhi.
- Thakur, R.S., Puri, H.S. and Hussain, A., 1989. Major Medicinal Plants of India. Central Institute of Medicinal and Aromatic Plants, CSIR, Lucknow.
- Swaminathan, M.S. and Kocchar, S.L.1989. Plants and Society. Macmillan Pub. London.

SUGGESTED LABORATORY / FIELD EXERCISES

- Study of microsporogenesis and gametogenesis in sections of anthers.
- Examination of modes of anther dehiscence and collection of pollen grains for microscopic examination (*Maize, Grasses, Cannabis Sativa Crotolaria, Tradiscantia, Brassica, Petunia, Solunum melongena etc.)*
- Tests for [p;;em voabo;otu isomg staoms and *in vitro* germination. Pollen germination using hanging drop and sitting drop cultures, suspension culture and surface culture.
- Estimating percentage and average pollen tube length *in vitro.*
- Role of transcription translation inhibitors on pollen germination and pollen tube growth.
- Pollen storage, Pollen-pistil interaction, self-incompatibility *in vitro* pollination.
- Study of ovule in cleared preparations, study of monosporic, bisporic and terrasporic types of embryo sac development through examination of permanent, stained serial sections.

- Field study of several types of flower with different pollination mechanisms (wind pollination thrips pollination bee/butterfly pollination, bird pollination.
- Emasculation, bagging and hand pollination to study of pollen germination, seed set and fruit development using self compatible and obligate out crossing system. Study of ceistogamous flowers and. Their adaptations.
- Study of nuclear and cellular endosperm through dissections and staining.

- Isolation of zygotic, globular, heart shaped, torpedo stage and nature embryo from suitable seeds and polyembryony in citrus, jamun (Syzygium cumin) etc. by dissections.
- Study of endospermic and non-endospermic seed.
- Study of seed dormancy and methods to break dormancy.
- Medicinal and Aromatic plants; Depending on the geographical location College/University select five medicinal and aromatic plants each from a garden, crop field or from the wild only if they are abundantly available. Papaver somniferum, Atropa belladonna, Catharanthus roseus, Adhatoda ceylanica, Allium sativum, Rauvolffia serpentina, Withania somnifera, Phyllanthus amarus, Andrographis paniculata, Aloe barbadense, Mentha arvesis, Rosa sp. Pogostemon cablins, Origanum vulgare, Vetivera zizanioides, Jasminum grandiflorum, Cymbopoogon sp., Pandanus odoratissimus.
- Study of live or herbarium specimens or other visual materials to become familiar with these resources.
- Vegetable oils; Mustard, Groundnut, Soya bean, Coconut, Sunflower and Castor.
- Gums, Resins, Tannins and Dyes; Perform simple tests for gums and resins. Prepare a water extract of vegetable tannins (Acacia. Terminalia, Mangroves. Tea. Cassia sp. Myrobalans) and dyes (Turmeric, Bixa orellana, Indigo, Butea monosperma, Lawsonia intermis) and perform tests to understand their chemical nature.

SUGGESTED READINGS FOR LABORATORY EXERCISE:

- Adriance, W. and Brison, R. Propagation of horticultural plants. Tata McGraw Hill pub. New Delhi.
- Sen. N. David, 1977. Environmental and seed germination of Indian plants. The chronica botanica co. New Delhi.
- Shivanna, K.R. and Rangaswamy, N.S. 1992 Pollen Biology : A Laboratory Manual. Springer-Verlag, Berlin.
- Shivanna, K.R., Johr, B.M. And Sastri, D.C. 1979. Development and physiology of angiosperm pollen. Today and tomorrows printers and pub. New Delhi.
- Vargheese, T.M. Experimental and applied embryology of angiosperms. Oxforc & IBS pub. Co. New Delhi.

M.Sc. SEMESTER - IV
PAPER - II
POLLUTION AND BIODIVERSITY CONSERVATION
MAX.MARKS-80

UNIT-I

CLIMATE, SOIL AND VEGETATION PATTERNS OF THE WORLD :
Life zones, major biomes, major vegetation types and soil types of the world, barren land.

UNIT-II
POLLUTION, CLIMATE CHANGE AND ECOSYSTEMS :
Air, water and soil pollution:- kinds, sources, quality parameters, effects on plants and ecosystem. Green house gases (Caron dioxide, methane, nitrous oxide, Chloro florocarbons: sources, trends and role), ozone layer, ozone hole, consequences of climate change) Carbon dioxide fertilization, global warming, seal level rise, UV radiation).

UNIT-III
BIOLOGICAL DIVERSITY :- Concepts and levels, status in India, Utilization and concerns, role of biodiversity in ecosystem functions and stability, speciation and extinction, IUCN categories of threat, distribution and global patterns, terrestrial biodiversity hot spots, inventory.

World centers of primary diversity of domesticated plants; The Indo Burmese center, plant introductions and secondary centers.

UNIT-IV
CONSERVATION STRATEGIES
Principles of conservation, extinctions, environmental status of plants based on International union for conservation of Nature.
In situ conservation, International efforts and Indian initiatives, protected areas in India- sanctuaries, national parks, biosphere reserves, Wetlands, Mangroves and coral reefs for conservation of wild biodiversity.
Ex situ conservation : Principles and practices, botanical gardens, field gene bank, seed banks, in vitro repositories, cryo banks, general account of the activities of Botanical survey of India (BSI), National Bureau of plant genetic resources (NBPGR), Indian council of Agriculture research (ICAR), Council of scientific and Industrial research (CSIR), and the department of Biotechnology (DBT) for conservation and non formal conservation efforts.

REFERENCE BOOKS :

Threshow, M1985. Air pollution and plant life, Wiley interscience.

Mason C.F. 1991. Biology of fresh water pollution, Longman.

Hill, M.K. 1997. Understanding Environmental pollution, Cambridge University press.

Anonymous, 1987. National gene bank, Indian heritage on plant genetic resources, National bureau of plant genetic resources.

Directory of Indian wet lands, 1993 WWF India and AWB, Kualalumpur.

Frankel, O.H., Brown, A.H.D. and Burdon, J.J. 1995. The conservation of Plant biodiversity, Cambridge University press, Cambridge, U.K.

Kothari, A. 1997. Understanding Biodiversity: Life sustainability and Equity, Orient Longman.

Nair, M.N.B. 1998. Sustainable management of non wood forest products, Faculty of forestry, University Putra Malaysia.

Paroda, R.S. and Arora R.K. 1991. Plant resources conservation and management, IPGRIP USA Campus, New Delhi.

Heywood, V.H. and Watson, R.T.1995. Global biodiversity assessment,

Cambridge University press Cambridge, U.K.

Brady, N.C. 1990. The nature and properties of soils, MacMilan.

Chandel, K.P.S., Shukla, G. and Sharma, N., 1996. biodiversity in medicinal and aromatic plants in India, conservation and utilization. National bureau of plant genetic resources, New Delhi.

Falk, D.A. Olwell, M Millan, C. 1996. Restoring biodiversity, Island press, Columbia, USA.

Gaston, K.J. Biodiversity: a biology of numbers and differences, Blackwell science Ltd. Oxford, U.K.

Heywood, V. 1995 Global biodiversity assessment. United nations environment programme, Cambridge University Press, Cambridge, U.K.

Heywood, V.H. and Wyse Jakon, P.S. 1991. Tropical botanical gardens, their role in conservation and development, Academic press San. Diego.

Walter, K.S. and Gillett H.J. 1998. 1997 IUCN Red list of threatened plants.

IUCN The World conservation union, IUCN, Gland, Switzerland and Cambridge, U.K.

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LIST OF PRACTICALS :

1. To prepare ombrothermic diagram for different sites on the basis of given data set and to comment on climate.
2. To determine soil moisture content, porosity and bulk density of soil collected from varying depths at different locations.
3. To determine the water holding capacity of soils collected from different locations.
4. To determine percent organic carbon and organic matter in the soils of cropland, grassland and forests.
5. To estimate rate of carbon dioxide evolution from different soils using soda lime or alkali absorption method.
6. To determine gross and net phytoplankton productivity by light and dark bottle method.
7. To estimate the dissolved oxygen content in eutrophic and oligotrophic water samples by azide modification method.
8. To estimate chlorophyll content in sulphur dioxide fumigated and unfumigated plant leaves.
9. To study environmental impact of a given developmental activity using checklist as a EIA method.
10. To determine diversity indices (Shannon Wiener, concentration of dominance, species richness, equability and B diversity.
11. Field survey of a part of town or city to make the students aware of the diversity of plants in urban ecosystems.

REFERENCE BOOKS FOR LABORATORY EXERCISE:

Magurran, A.E. 1988. Ecological diversity and its measurement, Chapman and Hall. London.
APHA-AWWA-WPCF Standard methods for the examination of water and waste water, American public health association, Washington, D.C.
Krebs, C.J. Ecologicl methodology, Harper and Row, New York, USA.
Pielou, E.C. 1984. The interpretation of ecological data, Wiley, New York.
Moore, P.W. and Chapman, S.B.1986. Methods in plant Ecology. Blackwell scientific publications.

M.Sc. SEMESTER - IV
PAPER – III
BIOTECHNOLOGY-II

PLANT CELL, TISSUE CULTURE AND ORGAN CULTURE

MAX.MARKS-80

UNIT-I

PLANTS CELLS AND TISSUE CULTURE: General introduction, history, scope, concept of cellular differentiation, cellular tot potency.

TISSUE CULTURE MEDIA: Introduction, Media constituents, Media selection, Media preparation.

CELL CULTURE: Introduction isolation of single cells. Suspension cultures, Culture of Single cell, Plant cell reactors, Applications of cell culture.

CLONAL PROPAGATION - Auxiliary bud proliferation, Meristem and shoot tip culture, bud culture.

ORGANOGENESIS AND ADVENTIVE EMBRYOGENESIS : Fundamental aspects of morphogenesis; organogenesis via callus formation, direct adventitive organ formation.

UNIT-II

SOMATIC EMBRYOGENESIS AND ANDROGENESIS : Mechanisms, techniques and utility.

SOMATIC HYBRIDIZATION : Methods of Protoplast isolation, Spontaneous and induced methods of protoplasm fusion, identification and selection of hybrid cells. Regeneration of hybrid plants. Verification and Characterization of somatic hybrids, Cybrids, posibilities, achievements and limitations of protoplast research.

UNIT-III

CRYOPRESERVATION AND GERMPLASM STORAGE: Raising sterile tissue cultures, Addition of cryoprotectants and pretreatment, freezing, storage, thawing, determination of survival viability. Plant growth and generation, verification, encapsulation and dehydration. Slow growth method, Applications.

INTELLECTUAL PROPERTY RIGHTS : Possible ecological risks and ethical concerns.

UNIT-IV

APPLICATION OF PLANT TISSUE CULTURE : Artificial seeds, Production of hybrids and soma clones.

PRODUCTION OF SECONDARY METABILITIES / NATURAL PRODUCTS : Morphological and chemical differentiations, Medium composition for secondary product formation. Growth production patterns, Environmental factors. Selection of cell lines producing high amounts of a useful metabolite, Problems associated with secondary metabolite production Immobilized cell system.

TRANSGENICS IN CROP IMPROVEMENT: Transgenic for Resistance to biotic and abiotic stresses, Transgenes for quality modification, Terminator seed technology. Chloroplast transformation and its utility.

Suggested Reading:

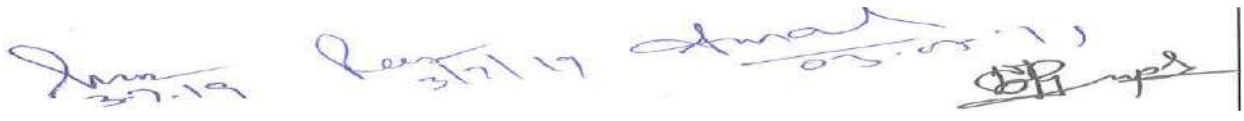
1. Bhojwani, S.S. and Razdan, M.K. 1996. Plant Tissue Culture: Theory and Practice revised edition). Elsevier Science Publishers, New York, U.S.A.
2. Bhojwani, S.S. 1990, Plant Tissue Culture; Application and Limitations. Elsevier Science Publishers, New York, USA.
3. Collins, H.A. and Edwards, S., 1998. Plants cell Culture Bio Scientific Publishers, Oxford UK.
4. Jain, S.M. Sopory, S.K. and Veilleux, R.E. 1996. In Vitro Hapliod Productin in Higher Plants, Vois. Fundamental Aspects and Methods Kluwer Academic Publishers. Dordrecht. The Netherlands.
5. Kartha, K.K. 1985. Cryopreservation of Plants Cells and Organs. CRC Press, Boca Raton, Florida, USA.
6. Raghavan, V. 1986. Embryogenesis, in Angiosperms: A Development an Experimental Study Cambridge University Press, New York, USA.
7. Vasil, Ikssshorpe, T.A. 1994. Plant Cell and Tissue Culture, Kluwer ACADEMIC publishers, The Netherlands.

Suggested Laboratory Exercise:

1. Isolation protoplast from various plant tissues and testing their viability.
2. Effect of physical (e.g. temperature) and chemical (e.g. osmoticum) factors on protoplast yield.
3. Demonstration of protoplast fusion employing PEG.
4. Organogenesis and somatic embryogenesis using appropriates explants and preparations of artificial seed.
5. Demonstration of and oogenesis in Datura.
6. Electroporation of protoplasts and checking of transient expression of the reporter gene.
7. Co-cultivation of the plant material (e.g.leaf discs) with Agrobacterium and study GUS activity histochemically.

Suggested Reading (for laboratory exercise) :

1. Butenko, R.G.2000. Plant Cell Culture, University Press of pacific.
2. Ckollin, H.A. and Edwards, S. 1998. Plant Cell Culture. Bios Scientific Published, Oxford, UK.
3. Dixon, R.A. (Ed.) 1987. Plant Cell Culture: A Practical Approach. IRL Press, Oxford.
4. George, F.F., 1993, plant propagation by tissue Culture. Part 2. The Technology, 2nd Exegetics Ltd. Edington, UK.
5. Hall, R.D.; (E.D.) 1999. Plant Cell Culture Protocols, Humana Press, Inc., New Jersey, USA.
6. Smith, R.H. 2000, Plant Tissue Culture: Technique and Experiments. Academic Press, New York.



M.Sc. SEMESTER - IV

PAPER - IV

ELECTIVE PAPER-- MOLECULAR PLANT PATHOLOGY

MAX.MARKS-80

UNIT-I

1. **Epidemiology and disease forecasting:** form of epidemics, factors responsible for the establishment of an epidemic, disease forecasting.
2. **General principles of plant disease control :** General account; Prophylactic. Chemical (including fungicides, systemic fungicides, fumigants, antibiotics, growth regulators etc.) and biological control; Breeding for disease resistance varieties of host plants, Plant quarantine.

UNIT-II

1. **Defense Mechanism-** Defense of host against pathogen, Structural defense; Physiological defense, Biochemical defense-role of phenolic compounds; Phytoalexins Defense through hyper-sensitive reactions.
2. **Resistance and susceptibility:** General account, types of resistance, vertical and horizontal resistance; breeding for disease resistance.

UNIT-III

1. **Wilt diseases:** General account, systems of diseases, Mechanism of wilting.
2. **Diseases due to fungi:** Rusts, smuts, Downy mildews powdery mildew diseases, Wilts, Leaf blight, Ergots, Tikka, necrosis, Rots-red rot of sugarcane, Damping off and warts diseases of economically important plants.
3. **Diseases due to Bacteria:** Bacterial blight of Rice, Tundu disease, citrus canker, Crown galls of stone fruits, Angular leaf spots.

UNIT-IV

1. **Diseases due to Viruses:** Mosaic of tobacco, Potato and tomato, Leaf curl of tomato & papaya, Yellow vein mosaic of Bhindi, Bunchy top of banana, Grassy shoot disease of sugarcane.
2. **Diseases due to Mycoplasma :** Sandal spike, Little leaf of Brinjal, Grassy shoot disease, Sesamum, phyllody, Citrus greening.
3. **Diseases due to Nematodes:** General characteristics of plants nematodes, Root knot, Malaya disease of Barley, wheat, Citrus nematodes, Ear cockle of wheat.

SUGGEST READINGS:

1. Plant Pathology - J.C. Walkar
2. Fungi and plant diseases - B.B. Mundkar
3. Plant Pathology – G.N. Agrios
4. Plant Pathology - Whecler
5. Plant Pathology (Vol.1-3) – Horsfall & Dimon
6. A text book of Modern Plant Pathology – K.S. Bilgrami and H. S.Dubey
7. Plant Pathology – R.S.singh
8. An introduction to Principles of Plant pathology - R.S.singh
9. Plant Disease of Crop plants in India – N.G. Rangaswamy.
10. Plant Pathology problems and progress- Honfall
11. Essentials of Plant Pathology- V.N. Pathak
12. Plant Pathology – Butter and Jones.
13. Plant Pathology- R.S. Malhotra
14. Crop plant Disease Colender- IARI-India.
15. Physiology of Fungus- – K.S. Bilgrami and H. S.Dubey
16. Micro-organisms in laboratory – G.P. Agarwal and S.K. Hasija.
17. Physiology of fungi – V.G.Lily and H.L.. Barnet.
18. Illustrated Genera of Imperfecti fungi- H.L.. Barnet and.B.B. Hunter.
19. Microbiology and Plant Pathology- P.D.Sharma
20. Plant Pathology- P.D.Sharma
21. Microbiology – P.D.Sharma
22. The Fungi – G. Sumbali
23. Fungicides and crop protection- H.G.Mewitt
24. Fungal diseases of plants- B.M. Duggar
25. Plant Pathology – P.C. Trivedi
26. Plant Pathology – G.P. Gupta
27. Virus and Plant diseases S.R.Mishra
28. Bacterial Diseases- V. Kumar
29. Biotechnology and Plant Pathology- V.K.Jain
30. Laboratory manual of Plant Pathology- D.K.Jha.
31. Modern technology of Plant Pathology- V.Suri.

M.Sc. SEMESTER – IV (Botany)

PAPER – IV

ELECTIVE PAPER-- LIMNOLOGY-II

MAX.MARKS-80

UNIT-1

1.Study of Biota

(a) Phytoplankton flora-classification of phytoplankton, special distribution of phytoplankton, seasonal distribution and species composition of phytoplankton. Algal blooms effects of salinity and climatic stresses on the distribution of phytoplankton, Phytobenthos-classification.

(b) Phytoplankton and their inter-relationship with Zooplanktons.

(c) Aquatic insects, birds and their environmental significance.

UNIT-II

1. Lake Flora-Higher Plants. Categories of aquatic higher plants, zonation of rooted higher plants, some peculiarities of aquatic higher plants.
2. Lake Bacteria-occurrence, characteristics and importance.
3. Ecological classification of aquatic higher aquatic plants and their significance.
4. Biotic relationship and interaction among organisms. Symbiosis, competition among algae, Parasitism of algae, predation of algae, impact of human being on algae.

UNIT-III

1. Concept of Productivity: Seasonal variation, Primary productivity in freshwater lakes, Estimation of Primary Productivity.
2. Bio indicators-Aquatic flora and fauna in relation to water quality in an aquatic environment.
3. Use and misuse of inland waters.
4. Methods of water quality testing BOD and COD.

UNIT-IV

1. Sewage–Definition, composition and its treatment.
2. Pollution by Domestic and Agriculture sewage, Industrial effluent.
3. Causes of pollution of Aquatic Resources, their management and conservation.
4. Resource Conservation–Aquatic pollution, control, legislation, regulation on discharge of industrial effluents and domestic wastes in rivers and reservoirs.

Suggested Readings:

Anathakrishnan : Bioresources Ecology Goldman: Limnology
Odum: Ecology
Pawlosuske : Physico-chemical methods for water Limnology Wetzal : Chemical and biological methods for water pollution studies
Trivedi&Goyal : Chemical and biological methods for water pollution studies Welch: LimnologyVols.I-II
Perkins: Ecology
Arora : Fundamentals of environmental biology Ghoshe : Toxicology
Sood : Toxicology

Suggested laboratory Exercise

1. Sampling of phytoplankton and their qualitative and quantitative analysis.
2. Sampling of periphytes and macrophytes, and their qualitative and quantitative analysis.
3. Sampling of Zooplankton and their qualitative and quantitative analysis.
4. Primary production: Experiment-in-situ by light and dark bottle method.
5. Short-term productivity experiments for the understanding of diel variation in aquatic ecosystems.
6. Analysis of sediments for benthic fauna and flora.

Suggested Reading:

1. Adoni, A.D. et al. 1985. Workbook on Limnology. Pratibha Pub. Sagar 216 p.
2. APHA 1981. Standard Methods for the Examination of Water and Waste water. American Public Health Association, Washington.
3. Arber, A. 1920. Water Plants. Cambridge University Press.
4. Barnes, A.K. and K.H. Mann, 1980. Fundamentals of Aquatic Ecosystems. Blackwell Scientific Publication, Oxford.
5. Brown, A.L. 1971. Ecology of Fresh Water. Heinemann, London, 129 p. nd
6. Cole G.A., 1979. Text book of Limnology. 2
7. De, A.K., 1989. Environmental Chemistry. Wiley Eastern Limited, New Delhi.
8. Goldman, C.R. and A.J. Horne, 1983. Limnology. McGraw Hill Inc. Tokyo, 464 p.
9. Golterman H.L., 1975. Physiological Limnology. Elsevier Scientific Publishing Co., Amsterdam, The Netherlands, 489 p.
10. Hutchinson G.E. 1957. A Treatise on Limnology. Vol. I,II,III, John Wiley & Sons, NY.
11. Mackereth, F.J.H., 1963. Some methods of water Analysis for Limnologists. Fresh Water Biological Association. Scientific Publication, No. 21, Ambleside England.
12. Mackereth, F.J.H., J. Heron and J.F. Talling. 1978. Water Analysis : Some Revised Methods for Limnologists. Freshwater Biological Association, Sci. Pub. No. 36.
13. Moss, B., 1980. Ecology of fresh waters. Blackwell Scientific Publications, Oxford, 417 p. rd
14. Odum, E.P. 1971. Fundamentals of Ecology. 3
15. Ruttner, F., 1963. Fundamentals of Limnology, 3 p.
16. Schwoerbel, I. 1987. Handbook of Limnology. Gustav fisher, Verlag.
17. Strickland J.D.H. and T.R. Parson. 1972. A Practical Handbook of Sea Water Analysis. Fisheries Research Board of Canada, Ottawa.
18. Subramanyam, K. 1962. Aquatic Angiosperms C.S.I.R., New Delhi.
19. Welch, P.S. 1935. Limnology. McGraw Hill Co. N.Y., 472 p.
20. Welch, P.S. 1948. Limnological methods. Philadelphia, Blakiston Co. 381p.
21. Wetzel, R.G. 1975. Limnology0. W.B. Saunders Co., Phildalelphia, 743 p.

M.Sc. IV SEMESTER

PAPER –IV

ELECTIVE COURSE – ETHNO BOTANY

MAXIMUM MARKS : 80

Unit - I

- Plant Conservation by Tribes & role of Joint Forest Management Programme in Plant Conservation specially People's Protected Area
- Ethnobotany and its role in domestication and conservation of native plant and genetic resources.
- The protection of plant varieties and Intellectual Properties Rights.
- General account of conservation of medicinal plants.
- General role of Aromatic plants.

Unit-II

- General ideas of various system of medicine using plants.
- Basic knowledge of Ayurvedic, Homeopathic, Allopathic system of medicine.
- General idea of active principles of Plants.
- Herbal Cosmetics.
- General account of toxic plants and Harmful effect of plants on human society with special reference to allergic plants of Chhattisgarh.

Unit –III

- Endemic plants of Chhattisgarh.
- Endangered plants of Chhattisgarh.
- Techniques of cultivation and marketing of Aromatic plants –Podina, Lemon grass Kasturibhindi, Palmarosa.
- Techniques of cultivation ,marketing and importance of mushroom
- Techniques of cultivation, extraction of juice and importance of wheat grass.

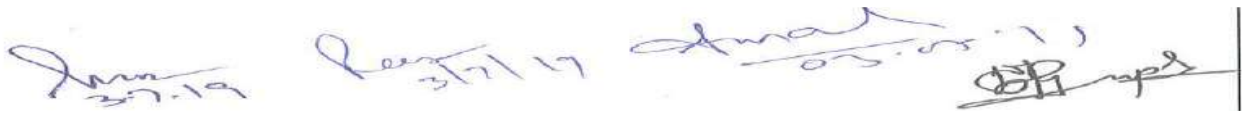
Unit-IV

- Ethnobotanical study of the following plants with special reference to their medicinal importance-

1. *Allium sativum* (Lahsun) 2. *Aegle marmelos* (Bel) 3. *Terminallia arjuna* (Arjun) 4 *T. bellerica* (Bahera) 5. *T chebula* (Harra) 6. *Calendula officianallis* (Calendula) 7. *Thuja occidentalis* (Vidhya) *8 Dhatura alba* (Dhatura) 9. *Argemone maxicana* (Pili kateli) 10. *Ephedra* sps. (Ephedra).

Suggested Readings :-

- Baker, H.G. 1978. Plants and Civilization (3 rd edition). C.A. Wadsworth, Belmont.
- Chandel, K.P.S., Shukla, G.& Sharma, N. 1996. Biodiversity in medicinal and Aromatic Plants in India: Conservation & Utilization. National Bureau of Plant Genetic Resources, New Delhi.
- Chrispeels, M.J. & Sadava, D. 1977. Plants, Food & People. W.H Freeman and Co., San Francisco.
- Ambasta S.P. (ed.) (1986). The Useful Plants of India. Publications & Information Direxorate, CSIR, New Delhi India.
- Anon. (1978). The tribes of Madhya Pradesh. Dept. of Tribal Welfare, Govt. of M.P. Bhopal.
- Arnold. J. E. M. & Ruiz Perez, M, (1998). The role of non-timber forest products in conservation and development. In: Wallenberg, Eva. & Andrew Ingles (Eds.) Income from the Forest, CIFOR 1998, Indonesia, pp-17 to 41.
- Asolkar, L.V. (1992). Second Supplement to Glossary of Medicinal Plants, (CSIR) NISCOM, New Delhi, India.
- Bal, S.N. (1984). Catalogue of Medicinal Plant Exhibits. BSI. Bishne Singh Mahendra Pal Singh, Cannaught Place, Dehra Dun, India.
- Buch, M.N. (1991). Forest of Madhya Pradesh, Madhya Pradesh Madhyam Bhopal.
- Chopra, R.N.; Badhwar, R.L. & Ghosh, S. (1965). Poisonous Plants of India. Vol. I. 2nd Ed. ICAR, New Delhi, India.
- Cotton C.M, (1996). Ethnobotany: Principals and Applications, John Willey & Sons, Chichester. New York.
- Faulks. P.J. (1958) An Introduction to Ethnobotany: Moredale Publications Ltd. London, England.
- Harshberger, J.W. (1896). Purposes of Ethnobotany Bot. Gaz. 21: 146-154.
- Jain S.K. and Phuipps, R.D. (1991). Medicinal Plants of India Rec. Pub.Algonac USA 2Vols. 1-849.
- Jain, S. K. (1991). Dictionary of India folk medicine and Ethnobotany. Deep publications. NEW DELHI, pp. 1-311.
- Jain, S. K. (1995). In Manual of Ethnobotany (edt. S.K. Jain,) Scientific Pubisher, Jodhpur. 128-134.
- Jain, S.K. & Rao, R.R. (1977). A handbook off field and herbarium methods. New Delhi: Today & Tomorrow's Printers and Publishers.
- Jain, S.K. (1981). Glimpses of Indian Ethnobotany. Oxford & IBH New Delhi, India.
- Jain, S.K. (1989). Methods and Approaches in Ethnobotany. Society of Ethnobotanist. Lucknow.
- Jain, S.K. and Mudgal, Hand Book of Ethanobotany. Bisen pal Singhm Mahendra Pal Singh Publication.
- Vaishnaw T.K. (2004). Chhattisgarh ki Anusuchit Janjatiyan, Adim Jati Anusandhan Avam Prshikshan Sansthan Raipur. Prakashan kramank 2, pp. 1-120
- Varghese, E. S. V D. (1996). Applied Ethnobotany - A case study among the Kharias of Central India. New Delhi. Deep Publications



- Jajoria, E, V.K. (1998); "The Kamar [A way of life.] Vanya Prakashan., Tribal Research and Development Institute. 35, Shamla Hills, Bhopal., ethnobot. Res.2:303-3 15.
- Joshi, S.G. (2000). Medicinal Plants, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, India.
- Kirtikar, K. R. & Basu, B.D. (1933-1935). Indian Medicinal plants. Vol. I to VIII (4 Vols. text & 4 vols. plates) Reprint 1994, Dehradun U.P.
- Maheshwari, J.K. Ed. (2000). Ethnobotany and Medicinal Plants of Indian Subcontinent. Scientific Publishers, Jodhpur
- Martin, G.J. (1995). Ethnobotany. Chapman and Hall, London.

Suggested Laboratory Exercises:-

Ethnobotany

2. Description and identification of medicinal plants and its medical properties.
3. Extraction of phytochemicals from various medicinal plants.
4. Preparation medicinal plants herbarium and photographs.
5. Herbal preparation –
    a. Preparation of digestive powder.
    b. Mouth freshener of Ajwain.
    c. Beverage of Tulsi,Bel,Tikhur,Mango.
    d. Ayurvedic tea preparation.
    e. Tablet of amla vati.
    f. Murabba of Awla/Bel.
    g. Herbal dye
    h. Shitopladi powder.

6. Identification and study of Ethnobotanical importance of some plants of Raipur.

To cultivate at least two medicinal plant in earthen po

हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

एम. एस–सी. रसायन शास्त्र
पाठ्यक्रम
सेमेस्टर परीक्षा– 2019–21

SYLLABUS

M. Sc. CHEMISTRY

SEMESTER EXAMINATION

2019-2021

EXAMINATION SCHEME

M.Sc. examination will be conducted in four SEMESTERS. Each semester exam shall consist of FOUR THEORY PAPERS AND TWO LAB COURSES.

SEMESTER –I (20 CREDIT)

THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH - 1	GROUP THEORY AND CHEMISTRY OF METAL COMPLEXES	4	3 Hrs	20	80	100
CH - 2	CONCEPTS INORGANIC CHEMISTRY	4	3 Hrs	20	80	100
CH - 3	QUANTUM CHEMISTRY, THERMODYNAMICS AND CHEMICAL DYNAMICS - I	4	3 Hrs	20	80	100
CH - 4	THEORY AND APPLICATIONS OF SPECTROS COPY-I	4	3 Hrs	20	80	100

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH - 5	Lab Course – I	2	8 Hrs	100
CH - 6	Lab Course – II	2	8 Hrs	100

SEMESTER –II (20 CREDIT)

THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH - 7	TRANSITION METAL COMPLEXES	4	3 Hrs	20	80	100
CH - 8	REACTION MECHANISMS	4	3 Hrs	20	80	100
CH - 9	QUANTUM CHEMISTRY, THERMODYNAMICSAND CHEMICAL DYNAMICS - II	4	3 Hrs	20	80	100
CH - 10	THEORYANDAPPLICATIONS OFSPECTROSCOPY-II	4	3 Hrs	20	80	100

5/7/2019 5/7/2019

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH - 11	Lab Course – III	2	8 Hrs.	100
CH - 12	Lab Course – IV	2	8 Hrs.	100

SEMESTER –III (20 CREDIT)
THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMEN	THEORY MARKS	TOTAL MARKS
CH – 13	RESONANCE SPECTROSCOPY, PHOTOCHEMISTRY AND ORGANOCATALYSIS	4	3 Hrs	20	80	100
CH – 14	CHEMISTRY OF BIOMOLECULES	4	3 Hrs	20	80	100
CH – 15	CATALYSIS, SOLID STATE AND SURFACE CHEMISTRY	4	3 Hrs	20	80	100
CH – 16	ANALYTICAL TECHNIQUES AND DATA ANALYSIS	4	3 Hrs	20	80	100

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH – 17	Lab Course - V	2	8 Hrs.	100
CH – 18	Lab Course - VI	2	8 Hrs.	100

5/7/2019 5/7/2019

SEMESTER –IV
(20 CREDIT)

THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH – 19	INSTRUMENTAL METHODS OF ANALYSIS	4	3 Hrs	20	80	100
CH – 20	NATURAL PRODUCT AND MEDICINAL CHEMISTRY	4	3 Hrs	20	80	100
CH – 21	MATERIAL AND NUCLEAR CHEMISTRY	4	3 Hrs	20	80	100
CH - 22	ENVIRONMENTAL & APPLIED CHEMICAL ANALYSIS	4	3 Hrs	20	80	100
	OPTIONAL PAPERS **In place of CH 22 students can opt any optional papers CH 22a to CH 22c**					
CH – 22 a	CHEMISTRY OF SURFACTANTS	4	3 HRS	20	80	100
22 b	NANOCHEMISTRY	4				
22 c	POLYMERS	4				

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH - 23	Lab Course - VII	2	8 Hrs.	100
CH - 24	Lab Course - VIII	2	8 Hrs.	100

SCHEME FOR PRACTICAL EXAMINATION

EXPERIMENT	MARKS
Experiments	60
Viva-voce	20
Sessional Marks	20
TOTAL MARKS	**100**

5/7/2019 5/7/2019

FIRST SEMESTER

PAPER NO. CH –1

GROUP THEORY AND CHEMISTRY OF METAL COMPLEXES

Max. Marks 80

UNIT - I

SYMMETRY AND GROUP THEORY IN CHEMISTRY: Symmetry elements and symmetry operation, definitions of group, subgroup, relation between orders of a finite group and its subgroup. Conjugacy relation and classes. Point symmetry group. Schoen flies symbols, representations of groups by matrices (representation for the C_n, C_{nv}, C_{nh}, D_{nh} etc. groups to be worked out explicitly). Character of a representation. The great orthogonality theorem (without proof) and its importance. Character tables of C_{2v} , C_{2h}, C_{3v} and their use in spectroscopy.

UNIT - II

A. METAL-LIGAND BONDING: Limitation of crystal field theory, molecular orbital theory, octahedral, tetrahedral and square planar complexes. π-bonding and molecular orbital theory.

B. METAL-COMPLEXES: Metal carbonyls, structure and bonding, vibrational spectra of metal carbonyls for bonding and structural elucidation, important reactions of metal carbonyls. Preparation, bonding, structure and important reactions of transition metal nitrosyl,

Dinitrogen and dioxygen complexes: Tertiary phosphine as ligand.

UNIT –III

A. METAL–LIGAND EQUILIBRA IN SOLUTION: Stepwise and overall formation constants and their interaction, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand, chelate effect and its thermodynamic origin, determination of binary formation constants by pH- metry and spectrophotometry.

B. ISOPOLY ACID AND HETEROPOLYACID: Isopoly and heteropoly acids of Mo and W. Preparation, properties and structure. Classification, preparation, properties and structures of borides, carbides, nitrides and silicides.

SILICATES- Classification and structure.

SILICONES - Preparation, properties and application.

UNIT – IV

A. METAL CLUSTERS: Higher boranes, carboranes, metalloboranes and metallocarboranes. Metalcarbonyl and halide cluster, compounds with metal-metal multiple bonds.

B. CHAINS: Catenation, heterocatenation, intercatenation.

C. RINGS: Borazines, phosphazines.

BOOKS SUGGESTED:

1. Advanced Inorganic Chemistry, F.A. Cotton and Wilkinson, John Wiley.
2. Inorganic Chemistry, J.E. Huhey, Harpes and Row.
3. Chemistry of the Elements, N.N. Greenwood and A. Earnshow, Pergamon.
4. Inorganic Electronic Spectroscopy, A.B.P. Lever, Elsevier.
5. Comprehensive Coordination Chemistry, Eds.G. Wilkinson, R.D. Gillars and J.A. McCleverty, Pergamon.

5/7/2019 5/7/2019

PAPER NO. CH –2
CONCEPTS IN ORGANIC CHEMISTRY

Max. Marks 80

UNIT – I

A. **NATURE OF BONDING IN ORGANIC MOLECULES:** Localized and delocalized chemical bond, conjugation and cross-conjugation, Bonding in Fullerenes, Bonds weaker than covalent, Addition compounds, Crown ether complexes and cryptands. Inclusion compounds, Cyclodextrins, Catenanes and rotaxanes.

B. **AROMATICITY:** Aromaticity in benzonoid and non-benzenoid compounds, Huckel's rule anti-aromaticity, homo-aromaticity. PMO approach for Aromaticity, Annulenes.

UNIT - II

A. **CONFORMATIONAL ANALYSIS**: Conformational analysis of cycloalkanes, decalins, effect of conformation on reactivity, conformation of sugars, steric strain due to unavoidable crowding.

B. **STEREOCHEMISTRY:** Elements of symmetry, chirality, molecules with more than one chiral center, methods of resolution, optical purity, stereospecific and stereoselective synthesis. Asymmetric synthesis. Optical activity in the absence of chiral carbon (Biphenyls, allenes and spiranes), chirality due to helical shape**.**

UNIT - III

A. **REACTION INTERMEDIATES:** Generation, structure, stability and reactivity of carbocations, carbanions, free radicals, carbenes and nitrenes. Sandmeyer reaction, Free radical rearrangement and Hunsdiecker reaction.

B. **ELIMINATION REACTIONS:** The E_2, E_1 and E_1c B mechanisms. Orientation of the double bond. Reactivity, effects of substrate structures, attacking base, the leaving group and the medium.

UNIT - IV

PERICYCLIC REACTIONS: Classification of pericyclic reactions. Woodward-Hoffmann correlation diagrams. FMO and PMO approach. Electrocyclic reactions - conrotatory and disrotatory motions, 4n, 4n+2 and allyl systems. Cycloadditions - antarafacial and suprafacial additions, 4n and 4n+2 system, 2+2 addition of ketenes, 1, 3 dipolar cycloadditions and cheleotropic reactions. Sigmatropic rearrangements - suprafacial and antarafacial shifts of H, sigmatrophic shifts involving carbon moieties, 3, 3- and 5, 5- sigmatropic rearrangements. Claisen, Cope and Aza-Cope rearrangements. Ene reaction.

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BOOKS SUGGESTED:

1. Advanced Organic Chemistry, F.A.Carey and R. J. Sundberg, Plenum.
2. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman.
3. Structures and Mechanism in Organic Chemistry, C. K. Ingold, Cornell University Press.
4. Organic Chemistry, R. T. Morrison and R. N. Boyd, Prentice-Hall.
5. Modern Organic Reactions, H. O. House, Benjamin.
6. Principles of Organic Synthesis, R.O.C. Norman and J.M.Coxon, Blackle, Academic and Professional.
7. Pericyclic Reactions, S. M. Mukherji, Macmillan, India.
8. Reaction Mechanism in Organic Chemistry, S.M. Mukherji and S.P. Singh, Macmillian.
9. Stereo chemistry of Organic Compounds, D. Nasipuri, New AgeInternational.
10. Some Modern Methods of Organic Synthesis, W.Carruthers, Cambridge Univ. Press.
11. Rodd's Chemistry of Carbon Compounds, Ed. S. Coff
12. Organic Chemistry, Vol 2, I. L. Finar, ELBS.
13. Stereo selective Synthesis: A Practical Approach, M. Nogradi, and VCH.
14. Organic Chemistry, Paula Yurkanis Bruice, Pearson Education.

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PAPER NO. CH – 3

QUANTUM CHEMISTRY, THERMODYNAMICS AND CHEMICAL DYNAMICS – I

Max. Marks 80

UNIT - I

A. MATHEMATICAL CONCEPT IN QUANTUM CHEMISTRY:
Vector quantities and their properties. Complex numbers and Coordinate transformation. Differential and Integral Calculus, Basic rules of differentiation and Integration Applications.

B. The Schrodinger equation and postulates of quantum mechanics. Discussion of solutions of the Schrodinger equation to some model systems viz Particle in a box the harmonic oscillator, the rigid rotator, the hydrogen atom.

UNIT –II

BASICS OF THERMODYNAMICS: Maxwell's thermodynamic relations isotherm, vant's Hoff hypothesis. Partial molar volume and partial molar heat content. Chemical potential, Gibbs Duhem equation, variation of chemical potential with temperature and pressure. Chemical potential of ideal gases, pure solids, liquids and mixture of ideal gases. Activity and Fugacity, Determination of Fugacity, Variation of Fugacity with temperature and pressure.

UNIT –III

ELECTROCHEMISTRY–I: Electrochemistry of solutions. Debye-Huckel Onsager treatment and its extension, ion solvent interactions. Debey-Huckel-Limiting Law. Debye-Huckel theory for activity coefficient of electrolytic solutions. Determination of activity and activity coefficient, Ionic strength, Thermodynamics of electrified interface. Derivation of electro-capillarity, Lippmann equation (surface excess), methods of determination.

UNIT –IV

CHEMICAL DYNAMICS –I: Methods of determining rate laws, consecutive reactions, collision theory of reaction rates, steric factor, Activated complex theory, kinetic salt effects, steady state kinetics, and thermodynamic and kinetic control of reactions. Dynamic chain (Hydrogen-bromine and Hydrogen- chlorine reactions) and Oscillatory reactions (Belousov - Zhabotinsky reaction)

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BOOKS SUGGESTED:

1. The Chemistry Mathematics Book, E. Steiner, Oxford University Press.
2. Chemical Mathematics, D.M, Hirst, Longman.
3. Applied Mathematics for Physical Chemistry, J.R. Barrante, Prentice Hall.
4. Physical Chemistry, P.W. Atkins, ELBS.
5. Coulson's Valence, R. McWeeny, ELBS.
6. Chemical Kinetics, K. J. Laidler, Pearson.
7. Kinetics and Mechanism of Chemical Transformations, J. Rajaraman and J. Kuriacose, McMillan.
8. Modern Electrochemistry Vol.I and Vol. II, J.O.M. Bockris and A.K.N. Reddy, Plenum.
9. Thermodynamics for Chemists, S. Glasstone, EWP.
10. An Introduction to Electrochemistry S. Glasstone, EWP.
11. Organic Chemist's Book of Orbitals, L. Salem and W.L. Jorgensen, Academic Press
12. The Physical Basis of Organic Chemistry, H. Maskill, Oxford University Press.

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PAPER NO. CH - 4

THEORY AND APPLICATIONS OF SPECTROSCOPY- I

Max. Marks 80

UNIT -I

UNIFYING PRINCIPLES:

Electromagnetic radiation, interaction of electromagnetic radiation with matter- absorption, emission, transmission, reflection, dispersion, polarization and scattering, Uncertainty relation and natural line width and natural line broadening, transition probability, selection rules, intensity of spectral lines, Born-Oppenheimer approximation, rotational, vibrational and electronic energy levels.

UNIT- II

MICROWAVE SPECTROSCOPY:

Classification of molecules in term of their internal rotation mechanism, determination of rotation energy of diatomic and polyatomic molecules, effect of isotopic substitution on diatomic and polyatomic molecules. Intensities of rotational spectral lines and parameters of rotational and the transition frequencies, non-rigid rotors, Linear and symmetric top polyatomic molecules. Application in determination of bond length.

UNIT- III

SCATTERING SPECTROSCOPY:

A. Electron Diffraction Spectroscopy :Principle, instrumentations and application of Auger spectroscopy and Scanning Electron Microscopy for chemical characterization, electron diffraction of gases and vapours, The Wierl equation and co-related method, application of electron diffraction.

B. Theory, instrumentation and application of turbidimetry, nephelometry and fluorometry, Fluoroscence and phosphorescence and factors affecting them.

UNIT- IV

RAMAN SPECTROSCOPY:

Classical and quantum theories of Raman effect, pure rotational, vibrational and vibrational-rotational Raman spectra, selection rules, mutual exclusion principle, Resonance Raman spectroscopy, Coherent anti Stokes Raman spectroscopy (CARS), Instrumentation, Application of Raman effect in molecular structures, Raman activity of molecular vibration, structure of CO_2, N_2O, SO_2, NO_2, ClF_3.

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BOOKS SUGGESTED

1. Modern Spectroscopy, J.M. Hollas, John Wiley.
2. Fundamentals of Molecular Spectroscopy, C.N. Banwell.
3. Spectroscopy, B.K. Sharma, Goel Publication.
4. Organic Spectroscopy: Principles and Applications, Jag Mohan, Narosa Publication.
5. Spectroscopy Methods in Organic Chemistry, D.H. Williams & I. Fleming, Tata Mcgraw-Hill Publication.
6. Spectrophometric Identification of Organic Compounds, R.M. Silversteion & F. X. Webster, John Wiley Publication

PAPER NO. CH - 5
LABORATORY COURSE–I

Max. Marks 100

One Experiment from each section is compulsory

Sec-A (24 Marks)

01. Qualitative analysis of mixture containing 8 radicals including 2 less common metals from among the following by semimicro method.

Basic Radicals:

Ag, Pb, Hg, Bi, Cu, Cd, As, Sb, Sn, Fe, Al, Cr, Zn, Mn, Co, Ni, Ba, Sr, Ca, Mg, Na, K, Ce, Th, Zr, W, Te, Ti, Mo, U, V, Be, Li, Au, Pt.

Acid Radicals:

Carbonate, Sulphite, Sulphide, Nitrite, Nitrate, Acetate, Flouride. Chloride, Bromide, Iodide, Sulphate, Borate, Oxalate, Phosphate, Silicate, Thiosulphate, Ferrocyanide, Ferricyanide, Sulphocyanide, Chromate, Arsenate and Permanganate.

Sec-B (20 Marks)

02. QUANTITATIVE ANALYSIS:

Separation and determination of two metal ions in ores, alloys, or mixtures in solution, one by volumetric and the other by gravimetric methods.

Sec-C (16 Marks)

03. ESTIMATION OF:

01. Phosphoric acid in commercial orthophosphoric acid.
02. Boric acid in borax.
03. Ammonia in ammonium salt.
04. Manganese dioxide in pyrolusite.
05. Available chlorine in bleaching powder.
06. Hydrogen peroxide in a commercial sample.

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04. PREPARATIONS:-

Preparation of selected inorganic compound and their studies by I.R. electronic spectra, Mössbauer, E.S.R.And magnetic susceptibility measurements. Handling of air and moisture sensitive compounds

(1) VO (acac)2

(2) $TiO(C_9H_8NO)_2.\ 2H_2O$

(3) cis-K $[Cr(C_2O_4)_2(H_2O)_2]$

(4) Na $[Cr\ (NH_3)_2(SCN)_4]$

(5) Mn $(acac)_3$

(6) $K_2[Fe(C_2O_4)_3]$

(7) Prussian Blue, Turnbull's Blue.

(8) $[Co\ (NH_3)_6]\ [Co(NO_2)_6]$

(9) cis-[Co(trien) (NO2)2]Cl.H2O

(10) Hg [Co(SCN)4]

(11) $[Co(Py)_2Cl_2]$

(12) $[Ni\ (NH_3)_6]Cl_2$

(13) $Ni(DMG)_2$

(14) $[Cu\ (NH_3)_4]\ SO_4.H_2O$

Mark Scheme:-

Ex. 1	**24**
Ex 2	**20**
Ex 3/Ex 4	**16**
Sessional	**20**
Viva	**20**
Total	**100**

BOOKS SUGGESTED:

1. Vogel's Textbook of Quantitative Analysis, Revi Mendham, ELBS.
2. Synthesis and Characterization of Inorganic Compounds, W.L. Jolly, Prentice Hall.

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PAPER NO. CH –6
LABORATORYCOURSE–II

Max. Marks 100

One Experiment from each section is compulsory

Sec- A (30 marks)

ADSORPTION/SURFACE CHEMISTRY

1. To Study Surface tension-Concentration relationship for solutions (Gibbs equation).
2. To Verify the Freundlich and Langmuir Adsorption isotherms using acetic acid/oxalic acid and activated charcoal.
3. Determination of CMC of surfactants

PHASE EQUILIBRIA

1. To Construct the Phase diagram for three component system (e.g. chloroform-acetic acid-water).

CHEMICAL KINETICS

1. Determination of the effect of (a) Change of temperature (b) Change of concentration of reactants and catalyst and (c) Ionic strength of the media on the velocity constant of hydrolysis of an ester/ionic reactions.
2. Determination of the velocity constant of hydrolysis of an ester/ionic reaction in micellar media.
3. Determination of the rate constant for the decomposition of hydrogen peroxide by $Fe^{+++}$and Cu^{++}ions.
4. Determination of the primary salt effect on the kinetics of ionic reactions and testing of the Bronsted relationship (iodide ion is oxidized by persulphate ion).

SOLUTIONS/MOLECULAR WEIGHTS

1. Determination of molecular weight of non-volatile substances by Lands berger method.
2. Determination of Molar masses of Naphthalene/acetanilide
3. Molecular weight of polymers by viscosity measurements.

Sec- B (30 Marks)

CONDUCTOMETRY

1. Determination of the velocity constant, order of the reaction and energy of activation for hydrolysis of ethyl acetate by sodium hydroxide conductometrically.
2. Determination of solubility and solubility product of sparingly soluble salts (e.g., $PbSO_4$, $BaSO_4$) conductometrically.
3. Determination of pK_a of Acetic acid and verification of Ostwald dilution law.

POTENTIOMETRY/pH METRY

1. Determination of the strength of strong and weak acids in a given mixture using a potentiometer/pH meter.
2. Determination of the dissociation constant of acetic acid in DMSO, DMF, acetone and dioxane by titrating it with KOH.
3. Determination of the dissociation constant of monobasic/dibasic acid by Albert-Serjeant method.
4. Determination of Redox potential of Fe^{++}/Fe^{+++} system.

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POLARIMETRY

1. Determination of rate constant for hydrolysis/inversion of sugar using a polarimeter.
2. Enzyme kinetics –inversion of sucrose.
3. Determination of the specific and molecular rotation of optically active substances.

Mark Scheme:-

Ex-1	**30**
Ex -2	**30**
Sessional	**20**
Viva	**20**
Total	**100**

BOOKS SUGGESTED:

1. Experiments and Techniques in Organic Chemistry, D. Pasto, C. Johnson and M. Miller, Prentice Hall.
2. Macro scale and Microscale Organic Experiments. K.L. Williamson, D.C. Heath.
3. Systematic Qualitative Organic Analysis, H. Middleton, Adward Arnold.
4. Handbook of Organic Analysis –Qualitative and Quantitative, H. Clark, Adward Arnold.
5. Vogel's Textbook of Practical Organic Chemistry,
6. Practical Physical Chemistry, A.M. James and F.E. Prichard, Longman.
7. Findley's Practical Physical Chemistry, B.P. Levi
8. Experimental Physical Chemistry, R.C. Das and B. Behera, Tata McGraw Hill.

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SECOND SEMESTER
PAPER NO. CH - 7
TRANSITION METAL COMPLEXES

Max. Marks 80

UNIT - I

REACTION MECHANISM OF TRANSITION METAL COMPLEXES: Energy profile of a reaction, reactivity of metal complexes, inert and labile complexes, kinetic application of valence bond and crystal field theories, kinetics of octahedral substitution, anation reactions and reactions without metal ligand bond cleavage. Substitution reactions in square planar complexes, the trans effect. Redox reactions, electron transfer reactions, mechanism of one electron transfer reactions, outer sphere type reactions, cross reactions and Marcus-Hush theory, inner sphere type reactions.

UNIT - II

ELECTRONIC SPECTRA AND MAGNETIC PROPERTIES OF TRANSITION METAL COMPLEXES:

Spectroscopic ground states, Selection rules, mechanism for breakdown of the selection rules, intensity of absorption, band width correlation, Orgel and Tanabe-Sugano diagram for transition metal complexes (d^1-d^9 states), spectra of d-d metal complexes of the type $[M(H_2O)_6]^{n+}$, spin free and spin paired ML_6 complexes of other geometries, Calculations of Dq, B and β parameters, spin forbidden transitions, effect of spin-orbit coupling, Spectrochemical and Nephelouxetic series. Magnetic properties of complexes of various geometries based on crystal field model, spin free-spin paired equillibria in octahedral stereochemistry.

UNIT - III

A. **TRANSITION METAL COMPLEXES:** Tranisition metal complexes with unsaturated organic molecules, alkanes, allyl, diene dienyl, arene and trienyl complex, preparations, properties, nature of bonding and structure features. Important reaction relating to nucleophilic and electrophilic attack on ligands and organic synthesis.
B. Transition Metal Complexes with Bond to hydrogen.

UNIT-IV

A. **ALKYLS AND ARYLS OF TRANSITION METALS:** Types, routes of synthesis, stability and decomposition pathways, organocopper in organic synthesis.
B. **COMPOUNDS OF TRANSITION METAL - CARBON MULTIPLE BONDS :**Alkylidenes, low valent carbenes, nature of bond and Structural characteristics.
C. **FLUXIONAL ORGANOMETALLIC COMPOUNDS:** Fluxionality and dynamic equilibria in compounds such as olefin, allyl and dienyl complexes.

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BOOKS SUGGESTED :

1. Pinciples and application of organotransition metal chemistry, J.P. Collman, L.S. Hegsdus, J. R. Norton and R.G. Finke, University Science Books.
2. The Organometallic chemistry of the Transition metals, R.H. Crabtree, John Wiley.
3. Metallo - organic chemistry, A.J. Pearson, Wiley.
4. Organometallic chemistry, R.C. Mehrotra and A. Singh, Newage International.
5. Principles of organometallic chemistry, P. Powel, Springer

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PAPER NO. CH - 8
REACTION MECHANISMS

Max. Marks 80

UNIT-I

A. **ALIPHATIC NUCLEOPHILIC SUBSTITUTION**: The SN2 and SN1 mechanisms. The neighboring group mechanism, neighboring group participation by π and σ bonds, anchimeric assistance. Reactivity effects of substrate structure, attacking nucleophile, leaving group and reaction medium, phase transfer catalysis, ambident nucleophile and regioselectivity.

B. **AROMATIC NUCLEOPHILIC SUBSTITUTION:** The SNAr, SN1 and benzyne mechanisms. Reactivity -effect of substrate structure, leaving group and attacking nucleophile. The von Richter, Sommelet-Hauser, and Smiles rearrangements.

UNIT – II

A. **ALIPHATIC ELECTROPHILIC SUBSTITUTION:** Mechanisms of – SE1, SE2 electrophilic substitution accompanied by double bond shifts. Effect of substrates, leaving group and the solvent polarity on the reactivity.

B. **AROMATIC ELECTROPHILIC SUBSTITUTION:** The arenium ion mechanism, Orientation and reactivity. Theortho/para ratio, ipso attack, orienation in other ring systems. Reactivity-Effect of substrates and electrophiles. Vilsmeir reaction and Gattermann-Koch reaction.

UNIT - III

ADDITION TO CARBON-CARBON MULTIPLE BONDS: Mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles and free radicals, regio- and chemoselectivity. Addition to cyclopropane ring, Hydrogenation of double and triple bonds, hydrogenation of aromatic rings, Hydroboration, Micheal reaction. Sharpless asymmetric epoxidation.

UNIT - IV

ADDITION TO CARBON-HETERO MULTIPLE BONDS: Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acids, esters and nitriles.Addition of Grignard Reagents, Organo-Zinc and Organo-lithium to carbonyls and unsaturated carbonyl compounds, Wittig reaction.

Mechanism of condensation reactions involving enolates–Perkins, Aldol, Claisen, benzoin, Mannich, Knoevengel, Stobbereactions. Hydrolysis of esters and amides, ammonolysis of esters.

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BOOKS SUGGESTED:

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, Johan Wiley.
2. Modern Organic Reactions, H. O. House, Benjamin.
3. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackle Academic & Professional.
4. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman.
5. Structures and Mechanismin Organic Chemistry, C.K. Ingold, Cornell University Press.
6. Reaction Mechanismin Organic Chemistry, S.M. Mukherji and S.P. Singh, Macmillian
7. Organic Chemistry Concepts and Application, Jagdamba Singh, Pragati Prakashan
8. Organic reactions and mechanisms, P.S. Kalsi, New Age International.

PAPER NO. CH –9
QUANTUM CHEMISTRY, THERMODYNAMICS
AND CHEMICAL DYNAMICS - II

Max. Marks 80

UNIT –I

A. **APPLICATION OF MATRICES IN QUANTUM CHEMISTRY:** Addition and multiplication, inverse and transpose of matrices. Determinants in Quantum Chemistry**.**

B. **ANGULAR MOMENTUM IN QUANTUM CHEMISTRY:** Angular momentum, angular momentum Operators. Eigen functions and Eigen values for Angular momentum, Ladder operators.

C. **APPROXIMATE METHODS:** The variation theorem, linear variation principle. Perturbation theory (first order and non-degenerate). Applications of variation method and perturbation theory to the Helium atom.

UNIT –II

STATISTICAL THERMODYNAMICS: Probability, permutations and combinations, concepts of probability, Maxwell Boltzmann distribution. Different ensembles and Partition functions-translational, rotational, vibrational and Electronic partition functions. Thermodynamic function using appropriate Partition functions. Fermi-Dirac and Bose-Einstein Statistics and statistical basis of entropy. Heat capacity of solids, Debye and Einstein Models.

UNIT –III

ELECTROCHEMISTRY –II: Structure of electrified interfaces. Gouy-Chapman and Stern models. Over potentials and exchange current density, Derivation of Butler – Volmer equation, Tafelplot. Semiconductor interfaces, Theory of double layer at semiconductor- electrolyte. Solution interfaces, structure of double layer interfaces. Effect of light at semiconductor solution interfaces. Electro catalysis influence of various parameters.

UNIT –IV

CHEMICAL DYNAMICS –II: General features of fast reactions by flow method, relaxation method, flash photolysis and the nuclear magnetic resonance method. Dynamics of molecular motions, probing the transition state, dynamics of barrier less chemical reactions in solutions, dynamics of unimolecular reaction. [Lindemann –Hinshelwood, RRK and Rice-Ramsperger-Kassel-Marcus {RRKM}] theories of unimolecular reactions.

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BOOKS SUGGESTED:

1. The Chemistry Mathematics Book, E. Steiner, Oxford University Press.
2. Mathematics for Chemistry, Doggett and Sutclilffe, Longman.
3. Mathematical Preparation for Physical Chemistry, F. Daniels, McGraw Hall.
4. Chemical Mathematics, D.M, Hirst, Longman.
5. Applied Mathematics for Physical Chemistry, J.R. Barrante, Prentice Hall.
6. Basic Mathematics for Chemists, Tebbutt, Wiley.
7. Physical Chemistry, P.W. Atkins, ELBS.
8. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGraw Hill.
9. Quantum Chemistry, Ira N. Levine, Prentice Hall.
10. Coulson's Valence, R. McWeeny, ELBS.
11. Chemical Kinetics, K. J. Laidler, Pearson.
12. Kinetics and Mechanism of Chemical Transformations, J . Rajaraman and J. Kuriacose, McMillan.
13. Modern Electro chemistry Vol.I and Vol.II, J.O.M. Bockris and A.K.N. Reddy, Plenum.
14. Thermodynamics for Chemists, S. Glasstone EWP.
15. An Introduction to Electrochemistry S. Glasstone EWP.
16. Physical Chemistry, Ira N. Levine McGraw Hill.
17. Physical Chemistry, Silbey, Alberty, Bawendi, John-Wiley.

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PAPER NO. CH - 10

THEORY AND APPLICATIONS OF SPECTROSCOPY –II

Max. Marks 80

UNIT - I

ULTRAVIOLET AND VISIBLE SPECTROSCOPY:

Introduction, Intensity of vibrational – electronic spectra, Frank-Condon principle, dissociation energy, Rotational fine structure of electronic – vibrational transitions, shape of molecular orbitals of some molecules viz., H_2, He_2, N_2, O_2. Electronic spectra of organic molecules, chromophores, Applications of electronic spectroscopy and identification of organic molecules. Spectrophotometric studies of complex ions, determination of ligand/metal ratio in a complex, determination of stability constants.

UNIT - II

INFRA RED SPECTROSCOPY:

Introduction, simple and anharmonic oscillators in vibrational spectroscopy, diatomic-vibrating rotor, Modes of vibration in polyatomic molecules, vibration-coupling, Fourier Transform IR spectroscopy: instrumentation, interferometric spectrophotometer, sample handling, Factors influencing vibrational frequencies, Application of IR spectroscopy: Interpretation of IR spectra of normal alkanes, aromatic hydrocarbons, alcohols and phenols aldehydes and ketones, ethers, esters, carboxylic acids, amines and amides.

UNIT - III

MASS SPECTROMETRY:

Introduction, basic principles, separation of the ions in the analyzer, resolution, molecular ion peak, mass spectral fragmentation of organic compounds, factors affecting fragmentation, McLafferty rearrangement. Instrumentation, Characteristics of mass spectra of Alkanes, Alkenes, Aromatic hydrocarbons, Alcohols, Amines. Nitrogen rule, ring rule, Molecular weight and formula determination.

Gas chromatography-Mass spectrophotometry: Introduction.

UNIT - IV

NUCLEAR RESONANCE SPECTROPHOTOMETRY:

Theory of NMR spectroscopy, interaction of nuclear spin and magnetic moment, chemical shift, processional motion of nuclear particles in magnetic field, spin-spin splitting, coupling constants, factor affecting the chemical shift, shielding effect, effect of chemical exchange, hydrogen bonding, instrumentation of Fourier transform NMR spectrophotometer, structure determination of organic compounds, Carbon-13 NMR spectroscopy, Multiplicity-proton (^1H) decoupling-noise decoupling, off resonance decoupling, selective proton decoupling. Chemical shift (aliphatic , olephinic, alkyne, aromatic and carbonyl carbon)

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BOOKS SUGGESTED

1. Modern Spectroscopy, J.M. Hollas, John Wiley.
2. Fundamentals of Molecular Spectroscopy, C.N. Banwell.
3. Spectroscopy, B.K. Sharma, Goel Publication.
4. Organic Spectroscopy: Principles and Application, Jag Mohan, Narosa Publication.
5. Spectroscopic Methods in Organic Chemistry, D.H. Williams & I. Fleming, Tata Mcgraw-Hill Publication.
6. Spectrophometric Identification of Organic Compounds, R.M. Silverstein & F.X. Webster, John Wiley Publications.

PAPER NO. CH - 11
LABORATORY COURSE –III

Max. Marks 100

One Experiment from each section is compulsory

Sec- A (10 Marks)

01. GENERAL METHODS OF SEPARATION AND PURIFICATION OF ORGANIC COMPOUNDS WITH SPECIAL REFERENCE TO:

Solvent Extraction
Fractional Crystallisation

02. DISTILLATION TECHNIQUIES:

Simple distillation, steam distillation, Fractional distillation and distillation under reduced pressure.

Sec- B (30 Marks)

01. ANALYSIS OF ORGANIC BINARY MIXTURE:

Separation and Identification of organic binary mixtures containing at least one component with two substituents.

(A student is expected to analyses at least 10 different binary mixtures.)

Sec- C (20 Marks)

01. PREPARATION OF ORGANIC COMPOUNDS: SINGLE STEP REPARATIONS.

a. **Acetylation:** Synthesis of β-Naphthyl acetate from β-Naphthol/Hydroquinone diacetate from Hydroquinone.
b. **Aldol condensation:** Dibenzal acetone from benzaldehyde.
c. **Bromination:** p-Bromoacetanilide from acetanilide.
d. **Cannizzaro Reaction:** Benzoic acid and Benzyl alcohol from benzaldehyde.
e. **Friedel Crafts Reaction:** O-Benzoyl Benzoic acid from phthalic anhydride.
f. **Grignard Reaction:** Synthesis of triphenyl methanol from benzoic acid.
g. **Oxidation:** Adipic acid by chromic acid oxidation of cyclohexanol.
h. **Perkin's Reaction:** Cinnamic acid from benzaldehyde.
i. **Sandmeyer Reaction:** p-Chlorotoluene from p-toluidine/o-Chlorobenzoic acid from anthranilic acid.
j. **Schotten Baumann Reaction:** β-Naphthyl benzoate from: β-Naphthol / Phenyl benzoate from phenol.
k. **Sulphonation Reaction:** Sulphanilic acid from aniline.

Mark Scheme:-

Ex. 1	**10**
Ex. 2	**30**
Ex .3	**20**
Sessional	**20**
Viva	**20**
Total	**100**

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BOOK SUGGESTED :

1. Practical Organic chemistry by A. I. Vogel.
2. Practical Organic chemistry by Mann and Saunders.
3. Practical Organic chemistry by Garg and Saluja.
4. The Systematic Identification of Organic compounds, R.L. Shriner and D.Y. Curtin.
5. Semimicro Qualitative Organic Analysis, N.D. Cheronis, J.B. Entrikin and E.M. Hodnett.
6. Practical Physical chemistry by Alexander Findlay.
7. Experimental Physical chemistry, D. P. Shoemaker, G. W. Garland and J. W. Niber, McGraw Hill Inter science.
8. Findlay's Practical Physical chemistry.

PAPER NO. CH –12
LABORATORY COURSE –IV

Max. Marks 100

One Experiment from section A and two exercises from section B are compulsory.

Sec- A (10 Marks)

01. ERROR ANALYSIS AND STATISTICAL DATA ANALYSIS

1. Linear Regression Analysis
2. Curve Fitting
3. Student "t" Test
4. Data Analysis Using Basic Statistical Parameters
5. Calibration of volumetric Apparatus, Burette, Pipette Weight Box etc.

02. USE OF COMPUTER PROGRAMMES

The students will learn how to operate a PC and how to run standard programmes and packages. Execution of linear regression, X-Y plot, numerical integration and differentiation as well as differential equation. solution programmes. Monte Carlo and Molecular dynamics. Programmes with data preferably from physical chemistry laboratory. Further, the student will operate one or two or the packages such as MICROSOFT EXCEL, WORD, POWERPOINT, SPSS, ORIGIN, MATLAB, EASYPLOT.

Sec- B (2×25 Marks)

1 A. FLAME PHOTOMETRIC DETERMINATIONS

1. Sodium and Potassium when present together.
2. Sodium/Potassium in solid samples.
3. Solid Sodium and Potassium in Liquid Samples.
4. Lithium/Calcium/Barium/Strontium.
5. Cadmium and Magnesium in tap water.

B. NEPHELOMETRIC DETERMINATIONS

1. Sulphate
2. Phosphate
3. Silver

2. ELECTROPHORESIS

1. To separate cations of inorganic salts by paper electrophoresis.
2. Capillary Electrophoresis of water soluble Vitamins.

3. SPECTROSCOPY

01. Verification of Beer's Lambert Law.
02. Determination of stoichiometry and stability constant of inorganic (e.g. ferric –salicylclic acid) and organic (e.g. amine-iodine) complexes, thiocynam.
03. Characterization of the complexes by electronic and IR, UV spectral data.
04. Determination of Indicator constant (pK_a)of methyl red.

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Mark Scheme:-

Ex. 1	**10**
Ex 2	**25**
Ex 3	**25**
Sessional	**20**
Viva	**20**
Total	**100**

BOOKS SUGGESTED:

1. Computer and Common Sense, R. Hunt and J. Shelley, Prentice Hall.
2. Computational Chemistry, A.C. Norris.
3. Microcomputer Quantum Mechanics, J.P. Killngbeck, Adam Hilger.
4. Computer Programmingin FORTRANIV, V.Rajaraman, PrenticeHall.
5. An Introduction to Digital Computer Design, V. Rajaraman and T. Radhakrishnan, PrenticeHall.
6. Experiments in Chemistry, D.V. Jahagirdar.

THIRD SEMESTER

PAPER NO. CH - 13

RESONANCE SPECTROSCOPY, PHOTOCHEMISTRY AND ORGANOCATALYSIS

Max. Marks 80

UNIT –I

A. **ELECTRON SPIN RESONANCE SPECTROSCOPY:** Introduction, principle, Hyperfine coupling, spin polarization for atoms and transition metal ions, spin-orbit coupling and significance of g-tensors, application to transition metal complexes (having one unpaired electron).

B. **NUCLEAR QUADRUPOLE RESONANCE SPECTROSCOPY:** Quadrupole nuclei, quadrupole moments, electric field gradient, coupling constant, splittings, applications.

UNIT –II

A. **PHOTOELECTRON SPECTROSCOPY:** Basic principle for atoms and molecules;

Photo-electric effect, ionization process, Koopman's theorem, Auger electron spectroscopy,

Determination of Dipolemoment. Photoelectron spectra of simple molecules-ESCA.

B. **PHOTOACOUSTIC SPECTROSCOPY:** Basic principle of Photo acoustic Spectroscopy (PAS), PAS –gases and condensed system. Chemical and Surface applications.

UNIT –III

A. **PHOTOCHEMICAL REACTIONS:** Interaction of electromagnetic radiation with matter, Stern Volmer equation, types of excitations, fate of excited molecule, quantum yield, transfer of excitation energy, Actinometry.

B. **DETERMINATION OF REACTION MECHANISM**: Classification, rate constants and life times of reactive energy states , determination of rate constants of reactions. Effect of light intensity on the rate of photo chemical reactions.

C. **MISCELLANEOUS PHOTOCHEMICAL REACTIONS:** Photo-Fries reactions of anilides, Photo-Fries rearrangement. Barton reaction. Singlet molecular oxygen reactions. Photochemical formation of smog. Photo degradation of polymers, Photochemistry of vision.

UNIT –IV

A. **ORGANOCATALYSIS**

General Principles: Energetics, Catalytic cycles, catalytic efficiency and life time, selectivity. Type of organometallic reactions: Ligand substitution, Oxidative addition, reductive elimination and insertion and de-insertion. Homogeneous catalysis: Hydrogenetion of alkenes, Hydroformylation, Monosubstituted acetic acid synthesis, Wacker oxidation of alkenes. Alkenes metathesis, Palladium-Catalysed C-C bond forming reactions, asymmetric oxidation. Heterogenous catalysis: The nature of heterogenous catalysts, Fischer- Tropsch synthesis, alkene polymerization.

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BOOK SUGGESTED:

1. Infrared and Raman Spectra: Inorganic and Coordination Compounds, K. Nakamoto, Wiley.
2. Fundamentals of Photo chemsitry, K.K. Rohtagi- Mukherji, Wiley-Eastern.
3. Essentials of Molecular Photo chemistry, A. Gilbert and Baggott, Blackwell Scientific Publications.
4. Molecular Photo chemsitry, N.J. Turro, W.A. Benjamin.
5. Introductory Phto chemistry, A. Cox and T. Camp, McGraw-Hill.
6. Photochemistry, R.P. Kundall and A. Gilbert, Thomson Nelson.
7. Application of Spectroscopy of Organic Compounds, J.R. Dyer, PrenticeHall.
8. Organic Photo chemistry, J. coxon and B. Halton, Cambridge University Press.
9. Shriver & Atkins Inorganic Chemistry: P. Atkins, T. Overtone, J. Rourke, M. Weller, F. Armstrong Oxford University Press
10. Inorganic Chemistry: C.E. Housecraft, A.G. Sharpe, Pearson Education Limited.
11. InorganicChemistry:PrinciplesofStructureandReactivity:J.E.Huheey, Keiter, Keiter, OMedhi, Pearson Education

13 . Organo metallic Chemistry: AUnified Approach: R.C. Mehrotra, A.Singh, New Age Publishers.

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PAPER NO. CH - 14
CHEMISTRY OF BIOMOLECULES

UNIT-I **Max. Marks 80**

A. **BIOENERGETICS:** Standard free energy change in biochemical reactions, exergonic, endergonic. Hydrolysis of ATP, synthesis of ATP from ADP.
B. **ELECTRON TRANSFER IN BIOLOGY**: Structure and function of metalloproteins in electron transport processes–cytochromes and Ion-sulphur proteins, synthetic models.
C. **TRANSPORT AND STORAGE OF DIOXYGEN:** Heme proteins and oxygen uptake, structure and function of haemoglobin, myoglobin, haemocyanins and haemerythrin, model synthetic complexes of iron, cobalt and copper.

UNIT –II

A. **METALLOENZYMES**: Zinc enzymes – carboxypeptibase and carbonic anhydrase. Iron enzymes – catalase, peroxidase and cytochrome P-450. Copper enzymes-superoxide dismutase. Molybdenum oxatransferase enzymes –xanthineoxidase.
B. **ENZYME MODELS**: Host-guest chemistry, chiral recognition and catalysis, molecular recognition, molecular asymmetry and prochirality. Biomimetic chemistry, Cyclodextrin-based enzyme models, calixarenes, ionophores, synthetic enzymes orsynzymes.

UNIT –III

A. **ENZYMES:** Nomenclature and classification of Enzyme. Induced fit hypothesis, concept and identification of active site by the use of inhibitors.
B. **CO-ENZYME CHEMISTRY:** Structure and biological functions of coenzyme A, thiamine pyrophosphate, pyridoxal phosphate, NAD+, NADP+, FMN, FAD, lipoic acid, vitamin B12.
C. **BIOTECHNOLOGICAL APPLICATIONS OF ENZYMES:** Techniques and methods of immobilization of enzymes, effect of immobilization on enzyme activity, application of immobilization enzymes in medicine and industry. Enzymes and Recombinant DNA Technology.

UNIT –IV

A. **BIOPOLYMER INTERACTIONS:** Forces involved in biopolymer interaction. Electrostatic charges and molecular expansion, hydrophobic forces, dispersion force interactions. Multiple equilibria and various types of binding processes in biological systems. Hydrogen ion titration curves.
B. **THERMODYNAMICS OF BIOPOLYMER SOLUTIONS**: Thermodynamics of biopolymer solution, osmotic pressure, membrane equilibrium, muscular contraction and energy generation in mechnochemical system.
C. **CELL MEMBRANE AND TRANSPORT OF IONS**: Structure and functions of cell

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membrane, ion transport through cell membrane, irreversible thermodynamic treatment of membrane transport and Nerve conduction.

BOOKS SUGGESTED:

1. Principles of Bioinorganic Chemistry, S.J. Lippard and J.M. Berg, University Science Books.
2. Bioinorganic Chemistry, I. Bertini, H.B. Gray, S.L. Lippard and J.S. Valentine, University Science Books.
3. Inorganic Biochemistry vols II and I.Ed G.L. Eichhorn, Elservier.
4. Principles of Bioinorganic Chemistry, S.J. Lippard and J.M. Berg, University Science Books.
5. Bioinorganic Chemistry, I. Bertinin, H.B. Gary, S.J. Lippard and J.S. Valentine, University Science.
6. Inorganic Biochemistry vols I and II ed. G.L. Eichhorn, Elsevier.
7. Bioorganic Chemistry: A Chemical Approach to Enzyme Action, Hermann Dugas and C. Penny, Springer-verlag.
8. Understanding Enzymes, Trevor palmer, PrenticeHall.
9. Enzyme Chemistry: Impact and Applications, Ed. Collin J Suckling, Chapman and Hall.
10. Enzyme Mechanisms Ed, M.I. PageandA. Williams, Royal Society of Chemistry.
11. Fundamentals of Enzymology, N.C.PriceandL. Stevens, Oxford University Press.
12. Immobilizaed Enzymes: An Introduction and Applications in Biotechnology, Michael D. Trevan, and John Wiley.
13. Enzymatic Reaction Mechanisms, C. Walsh, W.H. Freeman.
14. Enzyme Structure and Mechanisms, A. Fersht, W.H. Freeman.
15. Biochemistry: The Chemical Reacitons fligingcells, D.E. Metzler, Academic Press.
16. Principles of Biochemistry, A.L. Lehninger, Wroth Publishers.
17. Biochemistry, L. Stryer, W.H. Freeman.
18. Biochemistry, J. David Rawn, Neil Patterson.
19. Biochemistry, Voet and Voet, John Wiley.
20. Outlines of Biochemistry, E.E. Conn and P.K. Stumpf, John Wiley.
21. Bioorganic Chemistry : A Chemistry Approach to Enzyme Action, H. Dugas and C. Penny, Springer- Verlag.
22. Biochemistry and Molecular Biology of Plants, Buchanan, Gruissem and Jones, I.K. International Pvt. Ltd.

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PAPER NO. CH –15

CATALYSIS, SOLID STATE AND SURFACE CHEMISTRY

Max. Marks 80

UNIT –I

ACIDS, BASES, ELECTROPHILES, NUCLEOPHILES AND CATALYSIS :

Acid-base dissociation, Electronic and structural effects, acidity and basicity. Acidity function and their applications. Hard and soft acids and bases. Nucleophilicity scales. Nucleofugacity. The alpha effect. Ambivalent Nucleophilies. Acid base catalysis-specific and general catalysis. Bronsted catalysis, Enzyme Catalysis.

UNIT –II

MICELLES AND ADSORPTION :

Micelles : Classification of surface active agents, micellization, hydrophobic interaction, critical micellar concentration (CMC), factors affecting the CMC of Surfactants. Thermodynamics of micellization - phase separation and mass action models. Reverse micells, micro-emulsion. Micellar Catalysis, Surface tension capillary action, pressure difference across curved surface (Laplace equation), vapour pressure of droplets (Kelvin equation), Gibbs adsorption isotherm.

UNIT –III

SOLID STATE CHEMISTRY - I :

Crystal defects and Non-stoichiometry - Perfect and imperfect crystals, intrinsic and extrinsic defects - point defect, line and plane defects, vacancies - Schotty defects and Frankel defects. Thermodynamics of Schotty and Frenkel defect, formation of color centres, non-stoichiometry and defects. Electronic properties and Band theory of semiconductors.

UNIT –IV

MACROMOLECULES :

Polymer – Definition, types of polymers, electrically conducting, fire resistant, liquid crystal polymers, kinetics of polymerization, mechanism of polymerization.

Molecular mass, average molecular mass, molecular mass determination (Osmometry, Viscometry, diffusion and light scattering methods), Sedimentation, chain configuration of macromolecules, calculation of average dimensions of various chain structures.

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BOOKS SUGGESTED :

1. G.W. Castellan, "Physical Chemistry", Addison-Lesley Publishing Co.
2. E.A. Moelwyn Hughes, "Physical Chemistry", Pergamon Press.
3. Denbigh, "Chemical Equilibria", D. Van Nostrand.
4. J. Rose, "Dynamic Physical Chemistry" Sir Issac Pitman and Sons.
5. Solid state"Chemistry and its Applications, A.R. West, Plenum.
6. Principle of Solid State H.V. Kar, Wiley Eastern.
7. Solid State Chemists, D.K. Chakrabarty, New Age International (P)Ltd.
8. Micelles, Theoretical and Applied Aspects, V. Moral Plenum.
9. The Chemistry Mathematics Book, E. Steiner, Oxford University Press.
10. Mathematics for Chemistry, Doggett and Sutcliffe, Longman.
11. Mathematical Preparation for Physical Chemistry, F. Daniels, McGrawHill.
12. Chemical Mathematics, D.M. Hirst, Longman.
13. Applied Mathematics for Physical Chemistry, J.R. Barrante, Prentice Hall.
14. Basic Mathematics for Chemists, Tebbutt, Wiley.
15. Quantum Chemistry, Ira N. Levine, Prentice Hall.
16. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGrawHill.

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PAPER NO. CH –16
ANALYTICAL TECHNIQUES AND DATA ANALYSIS

Max. Marks 80

UNIT –I

SAMPLE PREPARATION, DIGESTION AND STATISTICAL ANALYSIS

A. Sampling - Collection, Preservation and preparation of sample, Techniques of sampling solids, liquids and gases, Operation of drying and preparing a solution of the analyte.

Principle, methodology and application of different types of digestions such as acid digestion, base digestion, enzymatic and microwave digestion for liquid and solid materials.

B. Evolution and procession of Analytical Data, Precision and Accuracy, Types of Errors, Propagation of errors, Normal Distribution Curve, Standard deviation, Confidence limit, Graphical presentation of result-Method of average, Method of Linear least square, Significant figures, Statistical aid to hypothesis testing-t-test,

F-test, Correlation coefficient, Rejection of data.

UNIT –II

SEPARATION TECHNIQUES

A. Efficiency of extraction, Selectivity of extraction, Extraction system, Method of Extraction, applications.

B. Principle, classification of chromatographic techniques, Technique and applications of paper chromatography, Thin-layer chromatography, HPLC, Column chromatography. Gas Chromatography

UNIT –III

THERMAL AND AUTOMATED METHODS

A. Principle, Instrumentation, Application of TGA, DTA and DSC methods.

B. Automated methods, Principle, instrumentation and application of flow injection analysis.

UNIT –IV

A. ELECTROCHEMISTRY

Principles and instrumentation of pH potentiometry, coulometry and conductometry.

B. POLAROGRAPHY

Basic principles, Diffusion current, polarized electrode, Micro electrode, Dropping Mercury Electrode, llkovic equation, Polarographic wave, Qualitative analysis Stripping methods, Cyclic Voltammetry, Amperometric titration:- curves, Differential pulse polarography and Squarewave polarography.

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BOOK SUGGESTED :

1. Fundamental of Analytical Chemistry- Skoog D.A. and West D.M.
2. Saunders, College Publication.
3. Textbook of Quantitative Inorganic Analysis-VogelA.I.
4. Principles and Practice of Analytical Chemistry- Fifield F.Wand Kealey
5. D. Black well Science
6. Instrumental Analysis R. Braun, McGraw Hill, International Edition.
7. Analytical Chemistry, Christian, G.D., WSE/Wiley.
8. Instrumental Analysis, Willard Meritt Dean, CBS.
9. Chemical Analysis, Brawn, McGrawHill.
10. Fundamental of Analytical Chemistry-Skoog D.A. and West D.M.
11. Principles of instrumental Analysis, Skoog Holler -Niemann.
12. Instrumental Analysis, Wizard Dean and Merit.
13. Principle and Practical Analytical chemistry, Fifield and Kealey.

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PAPER NO. CH - 17
LABORATORY COURSE–V

Max. Marks 100

Any Two experiments from the following are compulsory

1. Determination of the partition coefficient for iodine between carbon tetrachloride & (a) Water,
   (b) Aqueous potassium iodide.
2. Study of kinetics of exchange between ethyl iodide & the iodide ion.
3. Determination of the solubility product of lead iodide.
4. Determination of the dissociation constant of Barium Nitrate.
5. Determination of the concentration of iodine in a given sample (KI)by isotope dilution technique.
6. To study the effect of temperature, concentration of the reactant and catalyst on the rate of a chemical reaction (Hydrolysis/Nucleophilic Substitutuction).
7. To study Reaction between Sodium Formate and Iodine by
   01. Volumetric Method.
   02. Conductometric Method.
8. Saponification of ethylacetate
   01. Volumetric Method.
   02. Conductometric Method.
9. To study the reaction between Acetone and Iodine.
10. To study the autocatalylic reaction between $KMnO_4$ and Oxalic acid.
11. To study the reaction between $K_2S_2O_8$ and Iodine.
12. Determination of pKa by Kinetic Measurement.
13. Evaluation of Equilibrium constants from kinetic data.
14. Determination of rate constant of the decomposition of benzene diazonium chloride at different temperature.
15. To study the photolysis of uranyl oxalate.
16. To study the effect of substate catalyst etc (i) HCl, $K_2S_2O_8$ (ii) KOH, NaOH.
17. To study the Activation parameters.
18. To study the solvent effect using some Aprotic & Protic Solvents.
19. To examine the substituent effect (Hammette quation).
20. To study the effect of Electrolyte on the rate hydrolysis (KCl, NaCl,)
21. To study some simple enzyme catalyzed reaction.
22. To study the Micellar Catalyzed Reaction.

- **Some advanced level sophisticated instrument based (FTIR, NMR, GC-MS, AAS, FLUORESCENCE SPECTROPHOTOMETER, TENSIOMETER etc.) experiments may be given to the students**

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Marks Distribution

Ex. 1	**-**	**30**
Ex. 2	**–**	**30**
Viva	**–**	**20**
Sessional	**–**	**20**
Total	**-**	**100**

BOOK SUGGESTED:

1. Practical Physical Chemistry by Alexander Findlay.
2. Experimental Physical Chemistry, D.P. Shoemaker, C.W. Garland and J.W. Niber, McGraw Hill Inter science.
3. Findlay'sical Practial Chemistry, revised B.Phys. Levitt, Longman.

PAPER NO. CH –18
LABORATORY COURSE –VI

Max. Marks 100

Any Two experiments from the following are compulsory

Sec A (25 Marks)

01. SPECTROPHOTOMETRIC DETERMINATIONS

A. Manganese / Chromium, Vanadium in steel sample.
B. Nickel / Molybdenum / Tungsten / Vanadium / Uranium by extractive spectrophotometric method.
C. Fluoride / Nitrate /Phosphate.
D. Iron –phenanthroline complex; Job'sMethod for determination of stability constant of complex.
E. Zirconium –Alizarin Red –S complex: Mole-ratio method.
F. Copper –Ethylenediamine complex: Slope-ratio method.

02. POLAROGRAPHY
Composition and stability constant of complexes.

Sec B (25 Marks)

01. pHMETRY
Stepwise proton-ligand and metal-ligand stability constant of complexes by Leving – Rossoti methods.

02. FLAME PHOTOMETRIC DETERMINATIONS.
(i) Sodium and potassium when present together
(ii) Lithium / Calcium / Barium /Strontium.
(iii) Calcium and Magnesium in tap water.

03. REFRACTOMETRY
1. Determination of the specific and molar refraction of a given liquid by Abbe Refractometer.
2. Determine the variation of refractive index.
3. To verify law of refraction of mixture (glycerol +water).

Sec C (10 Marks)

01. SEPARATION AND QUANTITATIVE ESTIMATION OF BINARY AND TERNARY MIXTURES BY THE USE OF FOLLOWING SEPARATION TECHNIQUES:
1. Paper chromatography –Cadmium and Zinc, Zinc and Magnesium.
2. Thin–layer chromatography–separation of Nickel, Manganese, Cobalt and Zinc.
3. Ion-exchange.
4. Solvent extraction.
5. Electrophoretic separation.

❖ **Some advanced level sophisticated instrument based (FTIR, NMR, GC-MS, AAS, FLUORESCENCE SPECTROPHOTOMETER, TENSIOMETER etc.) experiments may be given to the students**

Marks Distribution

Ex. 1	**–**	**25**
Ex. 2	**–**	**25**
Ex. 3	**–**	**10**
Viva	**–**	**20**
Sessional	**–**	**20**
Total	**–**	**100**

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BOOK SUGGESTED:

1. Quantitative Inorganic Analysis, A.I. Vogel.
2. Test book of Quantitative chemical Analysis, A.I. Vogel.
3. Practical Physical chemistry, A.M. James and F.E. Prichard, Longman.
4. Findley's Practical Physical Chemistry, B.P.Leviu7
5. Experimental Physical Chemistry, R.C. Das and B. Behera, Tata McGrawHill.

FOURTH SEMESTER
PAPER NO. CH - 19
INSTRUMENTAL METHODS OF ANALYSIS

Max. Marks 80

UNIT –I

ADVANCED CHROMATOGRAPHY :

A. Ion chromatography: Ion exchange equilibrium, Ion-exchange packing and Inorganic Applications.
B. Size exclusion chromatography: Column packing, Theory and applications.
C. Supercritical fluid chromatography: Properties of supercritical fluid, SFC-Instrumentation and operating variables, comparison with other types of chromatography, applications.
D. Capillary Electrophoresis and capillary electrochromategraphy: overviews and applications

UNIT –II

X-RAY AND PROTON INDUCED SPECTROSCOPY:

A. X-Ray fluorescent method: Principles, Characteristics x-ray emission. Instrumentation, X-ray tube, radioactive sources. Wave length dispersive instruments. Energy dispersive instruments. Analytical Applications-Qualitative Analysis.
B. Proton Induced X-Ray Spectroscopy: Theory, instrumentation and applications.

UNIT –III

ATOMIC EMISSION SPECTROSCOPY

A. Selectivity, sensitivity and interferences of atomic spectroscopy.
B. Theory, instrumentation and application of flamephotometry, AES, ICP-AES and AFS.

UNIT –IV

ATOMIC ABSORPTION SPECTROSCOPY AND HYPHENATED TECHNIQUES

A. Theory, instrumentation and applications of flame and graphite furnace AAS, cold-vapour and hydride generation AAS.
B. Theory, instrumentation and application of hyphenated techniques i.e. GC/HPLC/MS-GC/IC/HPLC- ICP-MS.

BOOKS SUGGESTED:

1. Instrumental methods of analysis, Willard, Meritt and Dean.
2. Basic concepts of analytical chemistry, S.M. Khopkar, JohnWiley & Sons.
3. Metallurgical analysis, S.C. Jain.
4. Material Science and Engineering. An Introduction, W.D. Callister, Wiley.
5. Material Science, J.C. Anderson, K.D. Leaver, J.M. Alex ander and R.D. Rawlings, ELBS.
6. Fundamentals of Analytical Chemistry, Skoog, Welt, Holler and Crouch Thomson Learning Inc.

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PAPER NO. CH - 20
NATURAL PRODUCTS AND MEDICINAL CHEMISTRY

Max. Marks 80

UNIT-I

A. **Terpenoids and Carotenoids**: Classification, nomenclature, occurrence, isolation, general methods of structure determination of Citral, Geraniol, α-Terpeneol, Menthol, Farnesol, Zingiberene, Santonin, Phytol, Abietic acid and β – Carotene.

B. **Alkaloids:** Definition, nomenclature and physiological action, occurrence, isolation, general methods of structure elucidation, degradation, classification based on Nitrogen heterocyclic ring, role of alkaloids in plant. Synthesis and biosynthesis of the following: Ephedrine,
(+) - Conine, Nicotine, Atropine, Quinine and Morphine.

UNIT-II

A. **Steroids:** Isolation, structure determination and synthesis of Cholesterol, Bile acids, Androsterone, Testosterone, Esterone, Progestrone, Aldostrone and Biosythesis of cholesterol.

B. **Plant Pigments**: Occurrence, nomenclature and general method of structure determination. Isolation and synthesis of Apigenin, Luteolin, Quercetin, Myrcetin, Quercetin-3-glucoside, Vitexin, Diadzine, Butein, Aureusin, Cyanidin, Hirsutidin.

UNIT- III

A. Drug Design Development of new drugs procedures followed in drug design, concepts of lead compound and lead modification, concepts of prodrugs and soft drugs, Structure-Activity Relationship (SAR), Factors affecting bioactivity, resonance, inductive effect. Theories of drug activity: occupancy theory, rate theory, induced fit theory. Quantitative Structure Activity Relationship (QSAR)-Hansch approach-free Wilson model, relationship between free Wilson and Hans analysis

B. Concepts of drug receptors, lipophilicity, pharmacophore, pharmacological activity and typical range of parameters related to drug likeness.

C. General introduction of pharmacokinetics and pharmacodynamics.

UNIT – IV

A. **Antineoplastic Agents**: Introduction, Alkylating agents, antimetabolites, carcinolytic antibiotics, mitotic inhibitors.

B. **Antibiotics**: Constitution and synthesis of penicillins, chloramphenicol, tetracycline and streptomycin.

C. **Antimalarials**: Synthesis and properties of the following Antimalarial drug: 8-amino quinoline derivatives- Pamaquine, Primaquine, Pentaquine, Isopentaquine.

D. **aminoquinoline derivatives**- Santoquine, Camaquine, Acridine derivatives-Mepacrine, Azacrin, Pyrimidine and Biguanidine derivatives-Paludrine, Pyremethamine.

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Book Suggested:

1. Natural Products: Chemistry and Biological Significance, J. Mann, R.S. Davidson, J.B. Hobbs.
2. D.V. Banthrope and J.B. Harbrone, Longman, Essex., Organic Chemistry, Vol.2, I.L. Finar, ELBS.
3. Chemistry, Biologcal and Pharmacological properties of Medicinal Plants from the Americans, Ed. Kurt Hostettmann, M. P. Gupta and A. Marston, Harwood Academic Publishers.
4. Introductionto Flavonoids, B.A. Bhom, Harwood Academic Publishers.
5. New Trendsin Natural Product Chemistry, Att-ur-Rahman and M.I. Choudhary, Harwood, Academic Publishers.
6. Insecticides of Natural Origin, Sukh Dev, Harwood Academic Publishers.
7. Introduction to medicinal Chemistry, A Gringuage, Wiley-VCH.
8. Burger'sMedicinalChemistry-1(Chapter-9andCh-14), DrugEd. M.E. Discovery, Wolff, John Wiley.
9. The Science of Flavanoids, Erich Groteworld, Springer

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PAPER NO. CH – 21

MATERIAL AND NUCLEAR CHEMISTRY

Max. Marks 80

UNIT- I

NON EQUILIBRIUM THERMODYNAMICS:

Fundamental concepts, Forces and Fluxes, Entropy production, Phenomenological Laws and Onsager's theory for biological systems, coupled reactions.

UNIT- II

MATERIAL CHEMISTRY:

Preparation and Properties of Nanoparticles, Materials-Metals, Ceramics (Oxide, carbides, sulphides, nitrides). Physical and Chemical Methods, Size and Shape controlled Synthesis, Sol-gel methods, Optical Properties, Electrical and Magnetic Properties, Application of Nanoparticles.Characterization of Nanoparticles(SEM, TEMetc.)

UNIT-III

SUPRAMOLECULAR CHEMISTRY:

Properties of covalent bonds, bond length, inter bond angles, Force constant, bond and molecular dipole moment, molecular and bond polarizability.

Intermolecular Forces, hydrophobic effects, Electrostatic, induction, dispersion and resonance energy, Hydrogen bond, Magnetic interactions. Principles of molecular association and organization. Biological marcomolecules, Molecular receptors and design principle, cryptands, Cyclophanes, calixarenes and cyclodextrins.

Supramoleular reactivity and catalysis.

UNIT-IV

NUCLEAR AND RADIOCHEMISTRY NUCLEAR THEORY:

Nuclear cross section and nuclear radii, nuclear shells and magic numbers, theory of nuclear shell model, nuclear potentials, square well and simple harmonic oscillator potentials, application, liquid drop model, semi-empirical mass equation, application and limitations.

NUCLEAR FISSION:

Mass, energy and charge distribution of fission products, decay chains, prompt and delayed neutrons, liquid drop model of nuclear fission.

NUCLEAR ENERGY:

Nuclear fission, chain reaction, multiplication factor, nuclear reactors

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APPLIED RADIOCHEMISTRY:

Radioactive isotopes, purity and strength of radioisotopes. Radiochemical principle in the use of tracers, Application of Tracers in Chemical investigations, Physico-chemical methods, Analytical applications, Age determinations, Medical applications, Agricultural application.

BOOKS SUGGESTED:

1. Nuclear and Radio chemistry by G. Friedlander, J.W. Kennedy & J.M. Miller, John Wittey and Sons, Ine New York.
2. Source Book Atomic Energy–S. Glasstone, Affiliated East–West Press Pvt. Ltd. New Delhi.
3. Nuclear Physics by I. Kaplan, Addision –Welsly. Publishing company London.
4. Nuclear Chemistry and its applications, M. Haissinsky, Addision– Welsley, Publishing Company, London.
5. Essentials of Nuclear chemistry, H.J. Arnikar, Wiley Eatern Ltd, New Delhi.
6. Molecular Mechanics, U. Burkert and N.L. Allinger, ACS Monograph 177, 1982.
7. Mechanism and Theoryin Organic Chemistry, T.H. Lowry and K.C. Richrdson, Harper and Row.
8. Introduction to Theoretical Organic Chemistry and Molecular, Modelling, W.B. Smith, VCH, Weinheim.
9. Physical Organic Chemistry, N.S. Isaacs, ELBS./Longman.
10. Supramolecular Chemistry: concept and Perspectives, J.M. Lehn, VCH.
11. Quantum Chemistry, Ira N. Levine, PrenticeHall.
12. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGrawHill.

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PAPER NO. CH – 22
ENVIRONMENTAL & APPLIED CHEMICAL ANALYSIS

Max. Marks 80

UNIT –I

AIR POLLUTION MONITORING AND ANALYSIS

Classification of air pollution monitoring levels, air quality, standards and index, monitoring and analysis of selected air borne pollutants: SO_2, NO_x, SPM, Volatile organic compounds, Pb, CO_2, Persistent organic compounds, Hg, carbon and ozone. Air pollution control devices Viz ESP, scrubber technique, baghouse filters etc. Atmospheric chemistry of acid rains, photochemical smog, greenhouse effect, global warming, ozone hole.

UNIT –II

SOIL AND WATER POLLUTION

Soil and water quality standards, monitoring and analysis of selected soil and water contaminants: COD, pesticides, heavy metals, POP's, fluoride, cynide, nitrate, phosphate, oil & greese, Geobiochemical impact of municipal solid waste, steel plants effluent, domestic sewage. Control devices of water pollutants.

UNIT –III

FOOD ANALYSIS

1. Introduction to general constituents of food- Proximate Constituents and their analysis, Additives- Introduction, types, study of preservatives colors and antioxidants and methods of estimation, adulteration - Introduction, types, test for adulterants.
2. Introduction of standards composition and analysis of following foods: Wheat, Bread, Biscuits, Jam, Jelly, Honey, Milk, Ice Cream, Butter, Cheese, Milk Powder, Oils and Fats, Tea, Coffee, Soft drinks, Alcoholic beverages, Cereal and pulses, Confectionery, Fruits, Vegetables, Egg, Fish, Meat.

UNIT –IV

COSMETICS, CLINICAL AND DRUG ANALYSIS

A. Introduction of Cosmetics, evaluation of cosmetics materials, raw material and additives, Cosmetics colors, Perfumes in cosmetics, Cosmetics formulating, introduction, standards and methods of analysis- Creams, Face powders, Make-up, Shaving preparations, Bath preparations.

B. Concepts and principles of analytical methods commonly used in the clinical species: i.e. ammonia, Nitrogen, Ca, Cl, CO_2, Fe, K, Li, Mg, Na, P, urea, glucose.

Method for analysis of proteins (i.e. albumin, bilirubin, creatinine, cholesterol, HDL-cholesterol, triglycerides) and Enzymes (i.e. Alanine Aminotransferase, acid phosphatase, alkaline phosphatase, amylase, aspartate, aminotransferase, cholinesterase, lactate, and lipase).

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BOOKS SUGGESTED :

1. Environmental Chemistry, S.E. Manahan, Lewis Publishers.
2. Environmental chemistry, Sharma and Kaur, Krishna Publishers.
3. Environmental Chemistry, A.K. De, Wiley Eastern.
4. Environmental Chemistry, Analysis, S.M. Khopkar, Wiley Eastern.
5. Standard Method of Chemical Analysis, F.J. Welcher Vol. III, Van Nostr and Reinhold Co.
6. Environmental Toxicology, Ed.J. Rose, Gordon and Breach Science Publication.
7. Environmental Chemistry, C. Baird, W.H. Freeman.
8. Analytical chemistry, G.D. Christian, J.Wiley.
9. Fundamentals of Analytical Chemistry, D.A. Skoog, D.m. West and F.J. Holler, W.B. Saunders.
10. Analytical Chemistry - Principles, J.H. Kennedy, W. Saunders.
11. Analytical Chemistry-Principles, and Techniques, L. G.hargis, Prentice Hall.
12. Principles of Instrumental Analysis, D.A. Skoog and J.L.Loary, W.B. Saunders.
13. Principles of Instrumental Analysis, D.A. Skoog, W.B. Saunders.
14. Quantitative Analysis, R.A. Day, Jr. and A.L. Underwood, Prentice Hall.
15. Environmental Solution Analysis, S.M. Khopkar, Wiley Eastern. Basic Concepts of Analytical Chemistry, S.M. Khopkar, Wiley Eastern.
16. Handbook of Instrumental Techniques for Analytical Chemistry, F. Settle, Prentice Hall.
17. Environmental Biotechnology, Indushekhar Thakur, I.K. International Pvt.Ltd.
18. Fundamental of Analytical Chemistry D.A. Skoog, D.m. West, F.J. Holler and S.R. Crouch, Thompson Learning Inc.
19. APHA, 1977, "Methods of air c Health Sampling Association Washington and –Analysis US.

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OPTIONAL PAPERS

CH-22a

CHEMISTRY OF SURFACTANTS

UNIT- I

OVERVIEW OF SURFACTANTS: Classification of Surfactants, Physicochemical Properties of Surfactants, Critical Micelle Concentration, Determination, Effect of Additives, Aggregate Shapes , Structure and Morphology, Novel and New Generation Surfactants, Aggregation Behavior.

UNIT-II

PRINCIPLES OF SELF-ASSEMBLY: Closed and Continuous Association, Surfactant Micellization Pseudo-Phase Model, Mass Action Model, Estimation of Micelle Size, Size Dispersion of Micelles, Concentration Dependence of Micelle Size, Phase Behavior, Aggregation Behavior.

UNIT-III

SURFACTANT MIXTURES: Ideal and Non-Ideal Mixed Micelles, Regular Solution Model Size and Composition Distribution of Aggregates, Nonionic –ionic Surfactant Mixtures, Ionic -Ionic Surfactant Mixtures, Origin of Ideal and Non-Ideal Mixing Behavior, Polymer Surfactant Interaction.

UNIT-IV

APPLICATIONS OF SURFACTANTS: Micellar Catalysis, Quantitative Models, Micellar Enzymology, Phenomenon of Solubilization , Solubilization in Mixed Micelles, Drug Surfactant Interaction, Protein Surfactant Interactions, Microemulsions and its applications, Industrial Application of Surfactants.

BOOKS SUGGESTED:

1. Surfactants Edited by Th. F. Tadros, Academic Press.
2. Micelles: Theoretical and Applied Aspects by Y. Moroi.
3. Chemistry and Technology of Surfactants by R. J. Farn Wiley

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CH-22b
NANO CHEMISTRY

Max Marks 80

UNIT I

GENERIC METHODOLOGIES FOR NANOCHEMISTRY AND NANOTECHNOLOGY

Introduction and classification, What is nanotechnology?, Classification of nanostructures, Nanoscale architecture, Summary of the electronic properties of atoms and solids, The isolated atom, Bonding between atoms, Giant molecular solids, The free electron model and energy bands, Crystalline solids, Periodicity of crystal lattices, Electronic conduction, Effects of the nanometre length scale, Changes to the system total energy, Changes to the system structure, How nanoscale dimensions affect properties

UNIT -II

MATERIAL CHEMISTRY

Preparation and Properties of Nanoparticles, Materials-Metals, Ceramics (Oxide, carbides, sulphides, nitrides).physical and chemical Methods, Size and Shape controlled Synthesis, Sol-gel methods, Optical Properties, Electrical and Magnetic Properties, Application of Nanoparticles.

UNIT-III

CHARACTERIZATION METHODS

X-ray diffraction, Debye-Scherer formula, dislocation density, micro strain, Synchrotron Radiation, Principle and Applications, Raman Spectroscopy and its Applications, Dynamic Light Scattering (DLS). Electron microscopes: scanning electron microscope (SEM), transmission electron microscope (TEM), atomic force microscope (AFM), scanning tunneling microscope (STM), XPS, Working Principle, Instrumentation and Applications. Differential scanning calorimeter (DSC), Thermogravimetric/Diffferential Thermal Analyzer (TG/DTA), UV – Visible Spectrophotometer, FTIR, Principle and Applications, Photoluminescence (PL) Spectroscopy.

UNIT-IV

APPLICATIONS ON NANOCHEMISTRY

Nanobiology, Introduction, Bio-inspired nanomaterials, Interaction between Biomolecules and Nanoparticle Surfaces, Different Types of Inorganic Materials used for

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the Synthesis of Hybrid Nano-bio Assemblies, Applications of Nano in Biology, Nanoprobes for Analytical Applications, Current Status of Nanobiotechnology, Future Perspectives of Nanobiology; Nanosensors, Electrochemical, Nanobiosensors, Smart Dust; Nanomedicines, Nanodrug Administration Diagnostic and Thenrapeutic Applications.

BOOKS SUGGESTED :

01. Nanoparticles: From Theory to Application Edited by Gu¨nter Schmid, @ 2004 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

02. Nanoparticles and Catalysis Edited by Didier Astruc @ 2008 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

03. Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller, Fraser Armstrong, Mike Hagerman Shriver and Atkin's Inorganic Chemistry, Fifth Edition, Oxford, 2010.

04. Nanoscale Science and Technology, Robert W. Kelsall, Ian W. Hamley and Mark Geoghegan, John Wiley & Sons, Ltd., UK, 2005.

05. Introduction to Nanotechnology, Charles P. Poole Jr and Frank J. Owens, Wiley Interscience, 2003.

06. Nano:The Essentials: Understanding Nanoscience and Nanotecnology, T.Pradeep, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2008.

07. Handbook of Nanotechnology, Bharat bhushan, Springer

08. Textbook of Nanoscience and Nanotechnology, B.S.Murty, Baldev Raj, James Murday. Springer

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CH-22c
POLYMERS

Max Marks 80

UNIT-I

I Basics 8Hrs

Importance of polymers. Basic concepts: Monomers, repeat units, degree of polymerization. Linear, branched and network polymers. Classification of polymers. Polymerization: condensation, addition, radical chain-ionic and co-ordination and co-polymerization. Polymerization conditions and polymer reactions. Polymerization in homogeneous and heterogeneous system.

II PolymerCharacterization14Hrs

Polydispersion-average molecular weight concept. Number, weight and viscocity average molecular weights. Polydispersity and molecular weight distribution. The practical significance of molecular weight. Measurement of molecular weights. End-group, viscocity, light scattering, osmotic and ultra centrifugation methods. Analysis and testing of polymers-chemical analysis of polymers, spectroscopic methods, X-ray diffraction study. Microscopy. Thermal analysis and physical testing-tensile strength. Fatigue, impact. Tear resistance. Hardness and abrasion resistance.

UNIT-II

III Structure andProperties 14Hrs

Morphology and order in crystalline polymers-configurations of polymer chains. Crystal structure of polymers. Morphology of crystalline polymers, strain-induced morphology, crystallization and melting. Polymer structure and physical properties-crystalline melting point Tm- melting point of homogeneous series, effect of chain flexibility and other steric factors, entropy and heat of fusion. The glass transition temperature, Tg-Relationship between Tm and Tg, effects of molecular weight, diluents, chemical structure, chain topology, branching and cross linking. Property requirements and polymer utilization.

IV Polymer Processing 12Hrs

Plastics, elastomers and fibers. Compounding. Processing techniques: Calendaring, die casting, rotational casting, film casting, injection moulding, extrusion moulding, thermoforming, foaming, reinforcing and fibers spinning.

UNIT-IV

V Properties of Commercial Polymers 12Hrs

Polyethylene, polyvinyl chloride, polyamides, polyesters, phenolic resins, epoxy resins and silicone polymers. Functional polymers- Fire retarding polymers and electrically conducting polymers. Biomedical polymers-contact lens, dental polymers, artificial heart, kidney, skin and blood cells.

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BOOKS SUGGESTED

1. Textbook of Polymer Science, F W. BillmeyerJr. Wiley
2. Polymer Science, V R Gowarikar, N V Viswanathan and J Sreedhar, Wiley Eastern
3. Contemporary Polymer Chemistry, H R Alcock and F W Lambe, Prentice Hall.
4. Physics and Chemistry of Polymers, JMGCowie, Blackie Academic and Professional.
5. Polymer Chemistry introduction , Malcom T Stevens, Addison-Wesley Educational Publishers Inc.

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LABORATORY COURSE –VII

MAX MARKS 100

One Experiment from each section is compulsory

Sec-A (25 marks)

A. MULTI - STEP SYNTHESIS OF ORGANIC COMPOUNDS

(i) Beckmann Rearrangement: Benzanilide from benzene
(Benzene Benzophenone Benzo phenoneoxime Benzanilide).

(ii) Benzilic Acid Rearrangement: Benzilic acid from Benzoin
(Benzoin Benzil Benzilic acid)

(iii) Skraup's synthesis
(Synthesis of heterocyclic Quinoline from o – Aminophenol)

(iv) p –Bromoaniline from Aniline
(Aniline Acetanilide p - Bromoacetanilide p - Bromoaniline)

(v) p –Nitroacetanilide from Acetanilide
(Aniline Acetanilide p - Nitroactanilide p - Nitroaniline)

(vi) m –Nitroaniline from Benzene
(Benzene Nitrobenzene m - dinitrobenzene m - nitroaniline)

(vii) Acridone from Anthranilic acid
(Anthranilic acid o - Chlorobenzoic acid N - Phenylanthranilic acid Acridone)

(viii) Enzymatic Synthesis
Enzymatic reduction : Reduction of ethylaceenantiomeric excess of S(+) ethyl - 3 - hydroxybutanone and determine its optical purity.

Sec-B (20 marks)

A. QUANTITATIVE ORGANIC ANALYSIS

(i) Estimation of Sulphur by Messenger's Method.

(ii) Estimation of Nitrogen by Kjeldahl Method.

B. ESTIMATION OF FUNCTIONAL GROUP

(i) Extimation of Aniline.

(ii) Estimation of Amino Group By Acetylation Method.

(iii) Estimation of Hydroxyl Group By Acetylation Method.

(iv) Estimation of Carbonyl Group By Hydrazone Formation Method.

(v) Estimation of Carboxyl Group By Titration Method.

(vi) Determination of Equivalent Weight of Carboxylic Acid By Silver Salt Method.

(vii) Estimation of Glucose By Fehling Solution Method.

(viii) Estimation of Glycine By Titraiton Method.

Sec-C (15 marks)

A. EXTRACTION OF ORGANIC COMPOUNDS FROM NATURALSOURCES

(i) Isolation of caffeine from leaves.

(ii) Isolation of Casein from milk.

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(iii) Isolation of lactose from milk.
(iv) Isolation of nicotine dipicrate from tabacco.
(v) Isolation of Cinchonine from cinchona bark.
(vi) Isolation of Piperine from blackpepper.
(vii) Isolation Lycopene from tomatoes.
(viii) Isolation of β–Carotene fromcarrots.
(ix) Isolation of Limonene from citrusrinds.
(x) Isolation of protein and carbohydrates from seeds –colourtest
(xi) Extraction of Fatty oil from seeds and determination of refractive index of the oil.
(xii) Isolation of protein and carbohydrate (as reducing sugars) from seed-colour test.

B. Some advanced level sophisticated instrument based (FTIR, NMR, GC-MS, AAS, FLUORESCENCE SPECTROPHOTOMETER, TENSIOMETER etc.) Experiments may be given to the students.

Marks Distribution

Ex. 1	**–**	**25**
Ex. 2	**–**	**20**
Ex. 3	**–**	**15**
Viva	**–**	**20**
Sessional	**–**	**20**
Total	**–**	**100**

BOOKS SUGGESTED:

1. Practical Organic chemistry by A. I.Vogel.
2. Practical Organic chemistry by Mann and Saunders.
3. Practical Organic chemistry by Gargand Saluja.
4. The Systematic Identification of Organic compounds, R.L. Shriner and D.Y. Curtin.
5. Semimicro Qualitative Organic Analysis, N.D. Cheronis, J.B. Entrikin and E.M. Hodnett.
6. Experimental Organic chemistry, M. P. Doyle and W. S. Mungall.
7. Small Scale Organic preparation, P. J. Hill.
8. Experimental Biochemistry, byB.S. Roa and V. Deshp and e.I.K. International Pvt. Ltd.
9. Comprehensive Practical Organic Chemistry, Preparation and Qualitative Analysis, V.K. Ahluwalia and Renu Aggarwal, University Press.

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LABORATORY COURSE–VIII

Max. Marks 100

One Experiment From each section is compulsory

Sec –A (25 Marks)

A. SPECTROPHOTOMETRIC DETERMINATION

(i) Maganese/Chromium / Vanadium / Copper / Lead in Steel and Environmental / Industrial effluent samples.

(ii) Nickel / Molybdenum / Tungsten / Vanadium / Uranium by extractive spectrophotometric methd.

(iii) Fluoride/Nitrite/Phosphate in tap/pond/river industrial waste water.

(iv) Iron in water samples by thiocyanate and phenanthroline methods.

B. FLOW INJECTION ANALYSIS.

Determination of the following anions/cations in synthetic/real/ environmental samples.

(xiii) Ca^{2+}, Mg^{2+}, Al^{3+}, Mn^{2+}, Cr^{6+}, Fe^{3+}

(xiv) F^-, Cl^-, NO^-_2 , NO^-_3, PO_4^{3-}, SO^{2-}_4 BO^{3-}_3

C. ATOMIC ABSORPTION SPECTROPHOTOMETER

Determination of metal contents (Fe/Pb/As/Zn/Co/Ni etc.) in real and environmental samples.

Sec –B (25 Marks)

A. TITRIMETIC/GRAVIMETRIC DETERMINATIONS

a. Manganese in iron/Steelby Bismuthate/Linganane – Karplus/Periodate methods.
b. Maganese in pyrolusiteores.
c. Nickel in steel by dimethylglyoxine method.
d. Lead by dithizone precipitation.

Sec –C (10 Marks)

A. CHROMATOGRAPHIC SEPARATION

1. Sepraration and identification of the sugars present in the given mixture of glucose, fructose and sucrose by paper chromategraphy and determination of Rf values.
2. Thin layer chromatography – separation of nickel, manganese, cobalt and zinc, Determination of Rf values.

B. MISCELLANEOUS

a. Nutrient and micronutrient analysis in plant/soil/sediment.
b. Speciation of toxic metals i.e. As, Hg, Se, etc.
c. Analysis of clinical samples i.e. blood, urine, hair, etc.

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C. Some advanced level sophisticated instrument based (FTIR, NMR, GC-MS, AAS, FLUORESCENCE SPECTROPHOTOMETER, TENSIOMETER etc.) experiments may be given to the students.

Marks Distribution

Ex. 1	**–**	**25**
Ex. 2	**–**	**25**
Ex. 3	**–**	**10**
Viva	**–**	**20**
Sessional	**–**	**20**
Total	**–**	**100**

BOOK SUGGESTED:

1. Quantitative Inorganic Analysis, A.I. Vogel.
2. Standard Methods of Water Analysis.
3. Colorimetric Determination of Traces of Metals, E.B. Sandell.
4. GBC, Manuals on AAS analysis, Austria.

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A./M.Sc.(Mathematics) Semester Exam

UNDER

FACULTY OF SCIENCE

Session 2019-20

(Approved by Board of Studies)
Effective from June 2019

M.A./M.Sc. (MATHEMATICS)
(Semester-I) 2019-20

There shall be five papers. Each paper shall have 100 marks. **Overall tally of marks will be 500.**

Paper	Description	Theory	Sessional	Practical	Total Marks
I	Advanced Abstract Algebra (I)	80	20	-	100
II	Real Analysis (I)	80	20	--	100
III	Topology	80	20	--	100
IV	Advanced Complex Analysis (I)	80	20	--	100
V	Advanced Discrete Mathematics (I)	80	20	--	100

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.Sc./M.A. Course (First Semester)

PAPER -I

Advanced Abstract Algebra (I)

Max. Marks 80

Unit-I Groups - Normal and Subnormal series. Composition series. Jordan-Holder theorem. Solvable groups. Nilpotent groups.

Unit-II Field theory- Extension fields. Algebraic and transcendental extensions. Separable and inseparable extensions. Algebraically closed fields.

Unit-III Perfect fields. Finite fields. Primitive elements. Normal extensions, Splitting field.

Unit-IV Automorphisms of extensions. Galois extensions. Fundamental theorem of Galois theory.

Unit-V Solution of polynomial equations by radicals. Insolvability of the general equation of degree 5 by radicals.

Books Recommended:

1. P. B. Bhattacharya, S. K. Jain, S. R. Nagpaul: Basic Abstract Algebra, Cambridge University press
2. I. N. Herstein: Topics in Algebra, Wiley Eastern Ltd.
3. Vivek Sahai and Vikas Bist: Algebra, Narosa Publishing House, 1999.

References

1. M. Artin, Algebra, Prentice -Hall of India, 1991.
2. P. M. Cohn, Algebra, Vols. I, II &III, John Wiley & Sons, 1982, 1989, 1991.
3. N. Jacobson, Basic Algebra, Vols. I , W.H. Freeman, 1980 (also published by Hindustan Publishing Company).
4. S. Lang, Algebra, 3rd edition, Addison-Wesley, 1993.
5. I. S. Luther and I. B. S. Passi, Algebra, Vol. I-Groups, Vol.II-Rings, Narosa Publishing House (Vol.l-1996,Vol. II-1999)
6. D. S. Malik, J. N. Mordeson, and M. K. Sen, Fundamentals of Abstract Algebra, Mc Graw-Hill, International Edition, 1997.
7. Qazi Zameeruddin and Surjeet Singh : Modern Algebra
8. I. Stewart, Galois theory, 2nd edition, Chapman and Hall, 1989.
9. J. P. Escofier, Galois theory, GTM Vol.204, Springer, 2001..
10. Fraleigh , A first course in Algebra Algebra, Narosa,1982.

M.Sc./M.A. Course (First Semester)

PAPER-II

Real Analysis (I)

Max. Marks 80

Unit-I Sequences and series of functions, pointwise and uniform convergence, Cauchy criterion for uniform convergence, Weierstrass M-test, Abel's and Dirichlet's tests for uniform convergence, uniform convergence and continuity, definition and simple properties of Riemann-Stieltjes integral, uniform convergence and Riemann-Stieltjes integration, uniform convergence and differentiation, Weierstrass approximation theorem.

Unit-II Power series, uniqueness theorem for power series, Abel's and Tauber's theorems. Rearrangements of terms of a series, Riemann's theorem.

Unit-III Functions of several variables, linear transformations, Derivatives in an open subset of R^n, Chain rule, Partial derivatives, interchange of the order of differentiation, Derivatives of higher orders, Taylor's theorem, Inverse function theorem, Implicit function theorem.

Unit-IV Jacobians, extremum problems with constraints, Lagrange's multiplier method, Differentiation of integrals.

Unit-V Partitions of unity, Differential forms, Stoke's theorem.

Recommended Books:

1. Principle of Mathematical Analysis by Walter Rudin (3rd edition) McGraw-Hill, Kogakusha, 1976, International student edition.
2. Real Analysis by H. L. Roydon, Macmillan Pub. Co. Inc. 4th Edition, New York .1962.

References

1. T. M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar,Inc. New York, 1975.
3. A. J. White, Real Analysis; an introduction, Addison-Wesley Publishing Co., Inc.,1968.
4. G. de Barra, Measure Theory and Integration, Wiley Eastern Limited, 1981.
5. E. Hewitt and K. Stromberg. Real and Abstract Analysis, Berlin, Springer, 1969.
6. P. K. Jain and V.P. Gupta, Lebesgue Measure and Integration, New Age International (P) Limited Published, New Delhi, 1986 Reprint 2000).
7. I. P. Natanson, Theory of Functions of a Real Variable. Vol. l, Frederick Ungar Publishing Co., 1961.
8. Richard L. Wheeden and Antoni Zygmund, Measure and Integral: An Introduction to Real Analysis, Marcel Dekker Inc.1977.
9. J. H. Williamson, Lebesgue Integration, Holt Rinehart and Winston, Inc. New York. 1962.
10. A. Friedman, Foundations of Modern Analysis, Holt, Rinehart and Winston, Inc., New York, 1970.
11. P. R. Halmos, Measure Theory, Van Nostrand, Princeton, 1950.
12. T. G. Hawkins, Lebesgue's Theory, of Integration: Its Origins and Development, Chelsea, New York, 1979.
13. K. R. Parthasarathy, Introduction to Probability and Measure, Macmillan Company of India Ltd., Delhi, 1977.
14. R. G. Bartle, The Elements of Integration, John Wiley & Sons, Inc. New York, 1966.
15. Serge Lang, Analysis I & II, Addison-Wesley Publishing Company, Inc. 1969.
16. Inder K. Rana, An Introduction to Measure and Integration, Norosa Publishing House, Delhi, 1997.
17. Walter Rudin, Real & Complex Analysis, Tata McGraw-Hill Publishing Co.Ltd. New Delhi, 1966.

M.Sc./M.A. Course (First Semester)

PAPER-III

Topology

Max. Marks 80

Unit-I Countable and uncountable sets. Infinite sets a n d the Axiom of Choice. Cardinal numbers and its arithmetic. Schroeder-Bernstein theorem. Cantor's theorem and the continuum hypothesis. Zorn's lemma, well-ordering theorem. Definition and examples of topological spaces. Closed sets. Closure. Dense subsets. Neighbourhoods. Interior, exterior and boundary. Accumulation points and derived sets. Bases and sub-bases. Subspaces and relative topology.

Unit-II Alternate methods of defining a topology in terms of Kuratowski Closure Operator and Neighborhood Systems. Continuous functions and homeomorphism. First and Second Countable spaces. Lindelof's theorems. Separable spaces. Second countability and separability.

Unit-III Separation axioms; their Characterizations and basic properties. Urysohn's lemma, Tietze extension theorem.

Unit-IV Compactness. Continuous functions and compact sets. Basic properties of Compactness. Compactness and finite intersection property. Sequentially and countably compact sets. Local compactness and one point compactification. Stone-Cech compactification.

Unit-V Compactness in metric spaces. Equivalence of compactness, countable compactness and sequential compactness in metric space. Connected spaces. Connectedness on the real line. Components. Locally connected spaces.

Recommended Books:

1. James R. Munkres, Topology, A First Course, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
2. K. D. Joshi, Introduction to General Topology, Wiley Eastern Ltd., 1983.

References

1. J. Dugundji, Topology, Allyn and Bacon, 1966 (reprinted in India by Prentice Hall of India Pvt. Ltd.).
2. George F.Simmons, Introduction to Topology and modern Analysis, McGraw-Hill Book Company, 1963.
3. J. Hocking and G Young, Topology, Addison-Wiley Reading, 1961.
4. J. L. Kelley, General Topology, Van Nostrand, Reinhold Co., New York,1995.
5. L. Steen and J. Seebach, Counter examples in Topology, Holt, Rinehart and Winston, New York, 1970.
6. W. Thron, Topologically Structures, Holt, Rinehart and Winston, New York,1966.
7. N. Bourbaki, General Topology Part I (Transl.),Addison Wesley, Reading, 1966.
8. R. Engelking, General Topology, Polish Scientific Publishers, Warszawa, 1977.
9. W. J. Pervin, Foundations of General Topology, Academic Press Inc. New York, 1964.
10. E. H. Spanier, Algebraic Topology, McGraw-Hill, New York, 1966.
11. S. Willard, General Topology, Addison-Wesley, Reading, 1970.
12. Crump W.Baker, Introduction to Topology, Wm C. Brown Publisher, 1991.
13. Sze-Tsen Hu, Elements of General Topology, Holden-Day, Inc.1965.
14. D. Bushaw, Elements of General Topology, John Wiley & Sons, New York, 1963.
15. M. J. Mansfield, Introduction to Topology, D.Van Nostrand Co. Inc. Princeton, N. J.,1963.
16. B. Mendelson, Introduction to Topology, Allyn & Bacon, Inc., Boston, 1962.
17. C. Berge, Topological Spaces, Macmillan Company, New York, 1963.
18. S. S. Coirns, Introductory Topology, Ronald Press, New York, 1961.
19. Z. P. Mamuzic, Introduction to General Topology, P. Noordhoff Ltd.,Groningen, 1963.
20. K. K. Jha, Advanced General Topology, Nav Bharat Prakashan, Delhi.

M.Sc./M.A. Course (First Semester)

PAPER-IV

Complex Analysis (I)

Max. Marks 80

Unit-I Complex integration, Cauchy-Goursat. Theorem. Cauchy's integral formula. Higher order derivatives. Morera's Theorem. Cauchy's inequality and Liouville's theorem. The fundamental theorem of algebra. Taylor's theorem. Laurent's series. Isolated singularities. Meromorphic functions.

Unit-II Maximum modulus principle. Schwarz lemma. The argument principle. Rouche's theorem Inverse function theorem.

Unit-III Residues. Cauchy's residue theorem. Evaluation of integrals. Branches of many valued functions with special reference to arg z, logz and z^a.

Unit-IV Definitions and examples of conformal mapping Bilinear transformations, their properties and classifications.

Unit-V Spaces of analytic functions. Hurwitz's theorem. Montel's theorem Riemann mapping theorem.

Recommended Books:

1. Complex Analysis by L.V.Ahlfors, McGraw - Hill, 1979.
2. J. B. Conway, Functions of one Complex variable, Springer-Verlag, International student-Edition, Narosa Publishing House,1980.

References

1. H. A. Priestly, Introduction to Complex Analysis, Clarendon Press, Oxford 1990.
2. Complex Function Theory By D.Sarason
3. Liang-shin Hahn & Bernard Epstein, Classical Complex Analysis, Jones and Bartlett Publishers International, London, 1996.
4. S. Lang, Complex Analysis, Addison Wesley, 1977.
5. D. Sarason, Complex Function Theory, Hindustan Book Agency, Delhi, 1994.
6. Mark J. Ablowitz and A.S. Fokas, Complex Variables: Introduction and Applications, Cambridge University press, South Asian Edition, 1998.
7. E. Hille, Analytic Function Theory (2 Vols.) Gonn & Co., 1959.
8. W. H. J. Fuchs, Topics in the Theory of Functions of one Complex Variable, D.Van Nostrand Co., 1967.
9. C. Caratheodory, Theory of Functions (2 Vols.) Chelsea Publishing Company, 1964.
10. M.Heins, Complex Function Theory, Academic Press, 1968.
11. Walter Rudin, Real and Complex Analysis, McGraw-Hill Book Co., 1966.
12. S. Saks and A.Zygmund, Analytic Functions, Monografic Matematyczne, 1952.
13. E. C. Titchmarsh, The Theory of Functions, Oxford University Press, London.
14. W. A. Veech, A Second Course in Complex Analysis, W.A. Benjamin, 1967.
15. S.Ponnusamy, Foundations of Complex Analysis, Narosa Publishing House, 1997.

M.Sc./M.A. Course (First Semester)

PAPER-V

Advanced Discrete Mathematics (I)

Max. Marks 80

Unit-I Formal Logic-Statements. Symbolic Representation and Tautologies. Quantifiers, Predicates and Validity. PropositionalLogic. Semigroups & Monoids-Definitions and Examples of Semigroups and monoids (including those pertaining to concatenation operation).

Unit-II Homomorphism of semigroups and monoids. Congruence relation and Quotient Semigroups. Subsemigroup and submonoids. Direct Products. Basic Homomorphism Theorem.

Unit-III Lattices-Lattices as partially ordered sets. Their properties. Lattices as Algebraic Systems. Sublattices, Direct products, and Homomorphisms. Some Special Lattices e.g., Complete, Complemented and Distributive Lattices. Boolean Algebras-Boolean Algebras as Lattices. Various Boolean Identities. The Switching Algebra example. Subalgebras,

Unit-IV Direct Products and Homomorphisms. Join-Irreducible elements, Atoms and Minterms. Boolean Forms and Their Equivalence. Minterm Boolean Forms, Sum of Products Canonical Forms. Minimization of Boolean Functions. Applications of Boolean Algebra to Switching Theory (using AND,OR & NOT gates). The Karnaugh Map Method.

Unit-V Grammars and Languages-Phrase-Structure Grammars. Rewriting Rules. Derivations. Sentential Forms. Language generated by a Grammar. Regular, Context-Free, and Context Sensitive Grammars and Languages. Regular sets, Regular Expressions and the Pumping Lemma. Kleene's Theorem. Notions of Syntax Analysis, Polish Notations. Conversion of Infix Expressions to Polish Notations. The Reverse Polish Notation.

Recommended Books:

1. Elements of Discrete Mathematics by C. L. Liu, McGraw-Hill Book Co.
2. J. P. Tremblay & R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill Book Co., 1997.

References

1. J. L. Gersting, Mathematical Structures for Computer Science, (3rd edition), Computer Science Press, New York.
2. Seymour Lepschutz, Finite Mathematics (International) edition (1983), McGraw-Hill Book Company, New York.
3. S. Wiitala, Discrete Mathematics-A Unified Approach, McGraw-Hill Book Co.
4. J. E. Hop croft and J. D Ullman, Introduction to Automata Theory, Languages & Computation, Narosa Publishing House.
5. C. L Liu, Elements of Discrete Mathematics, McGraw-Hill Book Co.
6. N. Deo. Graph Theory with Application to Engineering and Computer Sciences. Prentice Hall of India
7. K. L. P .Mishra and N. Chandrashekaran, Theory of Computer Science PHI(2002)

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.A. /M.Sc. (MATHEMATICS) (Semester-II)

2019-20 & Onward

There shall be five theory papers. Each paper shall have 100 marks. **Overall tally of marks will be 500.**

Paper	Description	Theory	Sessional	Practical	Total Marks
I	Advanced Abstract Algebra (II)	80	20	-	100
II	Real Analysis (II)	80	20	--	100
III	General and Algebraic Topology	80	20	--	100
IV	Advanced Complex Analysis (II)	80	20	--	100
V	Advanced Discrete Mathematics (II)	80	20	--	100

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.Sc. /M.A. Course (Second Semester)

PAPER-I

Advanced Abstract Algebra (II)

Max. Marks 80

Unit-I Modules - Cyclic modules. Simple modules. Semi-simple modules. Schuler's Lemma. Free modules. Noetherian and Artinian modules and rings-Hilbert basis theorem. Wedderburn Artin theorem. Uniform modules, primary modules, and Noether-Lasker theorem.

Unit-II Linear Transformations - Algebra of linear transformation, Singular and non singular transformation, characteristic roots and vectors, matrices and linear transformations.

Unit-III Canonical Forms - Similarity of linear transformations. Invariant subspaces. Reduction to triangular forms. Nilpotent transformations. Index of nilpotency. Invariants of a nilpotent transformation. The primary decomposition theorem. Jordan blocks and Jordan forms.

Unit-IV Smith normal form over a principal ideal domain and rank. Fundamental structure theorem for finitely generated modules over a Principal ideal domain and its applications to finitely generated abelian groups.

Unit-V Rational canonical from. Generalised Jordan form over any field.

Books Recommended:

1. P. B. Bhattacharya, S.K.Jain, S.R.Nagpaul : Basic Abstract Algebra, Cambridge University press
2. I. N. Herstein : Topics in Algebra, Wiley Eastern Ltd.
3. Qazi Zameeruddin and Surjeet Singh : Modern Algebra

References

1. M. Artin, Algebra, Prentice -Hall of India, 1991.
2. P. M. Cohn, Algebra,Vols. I, II &III, John Wiley & Sons, 1982, 1989, 1991.
3. N. Jacobson, Basic Algebra, Vols. I & II, W. H. Freeman, 1980 (also published by Hindustan Publishing Company).
4. S. Lang, Algebra, 3rd edition, Addison-Wesley, 1993.
5. I. S. Luther and I.B.S. Passi, Algebra, Vol. I-Groups, Vol.II-Rings, Narosa Publishing House (Vol.l-1996,Vol. II-1999)
6. D. S.Malik, J.N.Mordeson, and M.K.Sen, Fundamentals of Abstract Algebra, Mc Graw-Hill, International Edition, 1997.
7. K. B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
8. S. K. Jain,A. Gunawardena and P.B Bhattacharya, Basic Linear Algebra with MATLAB, Key College Publishing (Springer-Verlag),2001.
9. S. Kumaresan, Linear Algebra, A Geometric Approach, Prentice-Hall of India, 2000.
10. Vivek Sahai and Vikas Bist, Algebra, Narosa Publishing House, 1999.
11. I. Stewart, Galois Theory, 2nd edition, chapman and Hall, 1989.
12. J. P. Escofier, Galois Theory, GTM Vol.204, Springer, 2001.
13. T. Y. Lam, Lectures on Modules and Rings, GTM Vol. 189, Springer-Verlag,1999.
14. D. S. Passman, A Course in Ring Theory, Wadsworth and Brooks/Cole Advanced Books and Softwares, Pacific groves. California, 1991.
15. Fraleigh , A first course in Algebra Algebra, Narosa, 1982.

M.Sc./M.A. Course (Second Semester)
PAPER-II

Real Analysis (II)

Max. Marks 80

Unit-I Definition and existence of Riemann-Stieltjes integral, Properties of the Integral, integration and differentiation, the fundamental theorem of Calculus, integration of vector-valued functions, Rectifiable curves.

Unit-II Lebesgue outer measure. Measurable sets. Regularity. Measurable functions. Borel and Lebesgue measurability. Non-measurable sets. Integration of Non-negative functions. The General integral. Integration of Series.

Unit-III Measures and outer measures, Extension of a measure. Uniqueness of Extension. Completion of a measure. Measure spaces. Integration with respect to a measure. Reimann and Lebesgue Integrals.

Unit-IV The Four derivatives. Lebesgue Differentiation Theorem. Differentiation and Integration.

Unit-V Functions of Bounded variation. The L^p-spaces. Convex functions. Jensen's inequality. Holder and Minkowski inequalities. Completeness of L^p, Convergence in Measure, Almost uniform convergence.

Recommended Books:

1. Principle of Mathematical Analysis by W. Rudin
2. Real Analysis by H. L. Roydon

References

1. T. M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar,Inc. New York,1975.
3. A. J. White, Real Analysis; an introduction, Addison-Wesley Publishing Co., Inc., 1968.
4. G. de Barra, Measure Theory and Integration, Wiley Eastern Limited, 1981.
5. E. Hewitt and K. Stromberg. Real and Abstract Analysis, Berlin, Springer, 1969.
6. P. K. Jain and V.P. Gupta, Lebesgue Measure and Integration, New Age International (P) Limited Published, New Delhi, 1986 Reprint 2000).
7. I. P. Natanson, Theory of Functions of a Real Variable. Vol. l, Frederick Ungar Publishing Co., 1961.
9. Richard L. Wheeden and Antoni Zygmund, Measure and Integral: An Introduction to Real Analysis, Marcel Dekker Inc.1977.
10. J. H. Williamson, Lebesgue Integration, Holt Rinehart and Winston, Inc. New York. 1962.
11. A. Friedman, Foundations of Modern Analysis, Holt, Rinehart and Winston, Inc., New York, 1970.
12. P. R. Halmos, Measure Theory, Van Nostrand, Princeton, 1950.
13. T. G. Hawkins, Lebesgue's Theory, of Integration: Its Origins and Development, Chelsea, New York, 1979.
14. K. R. Parthasarathy, Introduction to Probability and Measure, Macmillan Company of India Ltd., Delhi, 1977.
15. R.G. Bartle, The Elements of Integration, John Wiley & Sons, Inc. New York, 1966.
16. Serge Lang, Analysis I & II, Addison-Wesley Publishing Company, Inc. 1969.
17. Inder K. Rana, An Introduction to Measure and Integration, Norosa Publishing House, Delhi, 1997.

M.Sc./M.A. Course (Second Semester)
PAPER-III

General and Algebraic Topology

Max. Marks 80

Unit-I Tychonoff product topology in terms of standard sub-base and its characterizations. Projection maps.

Unit-II Product spaces, separation axioms connectedness (Tychonoff's theorem). Compactness , product spaces Countability in product spaces.

Unit-III Embedding and metrization. Embedding lemma and Tychonoff embedding. The Urysohn metrization theorem. Metrization theorems and Paracompactness-Local finiteness. The Nagata-Smirnov metrization theorem. Paracompactness. The Smirnov metrization theorem.

Unit-IV Nets and filter. Topology and convergence of nets. Hausdorffness and nets. Compactness and nets. Filters and their convergence. Canonical way of converting nets to filters and vice-versa. Ultra-filters and Compactness.

Unit-V The fundamental group and covering spaces-Homotopy of paths. The fundamental group. Covering spaces. The fundamental group of the circle and the fundamental theorem of algebra.

Recommended Books:

1. James R. Munkres, Topology, A First Course, Prentice Hall of India Pvt. Ltd., New Delhi,2000.
2. K. D. Joshi, Introduction to General Topology, Wiley Eastern Ltd., 1983.

References

1. J. Dugundji, Topology, Allyn and Bacon, 1966 (reprinted in India by Prentice Hall of India Pvt. Ltd.).
2. George F.Simmons, Introduction to Topology and modern Analysis, McGraw-Hill Book Company, 1963.
3. J. Hocking and G Young, Topology, Addison-Wiley Reading, 1961.
4. J. L. Kelley, General Topology, Van Nostrand, Reinhold Co., New York,1995.
5. L. Steen and J. Seebach, Counter examples in Topology, Holt, Rinehart and Winston, New York, 1970.
6. W. Thron, Topologically Structures, Holt, Rinehart and Winston, New York,1966.
7. N. Bourbaki, General Topology Part I (Transl.),Addison Wesley, Reading, 1966.
8. R. Engelking, General Topology, Polish Scientific Publishers, Warszawa, 1977.
9. W. J. Pervin, Foundations of General Topology, Academic Press Inc. New York,1964.
10. E. H. Spanier, Algebraic Topology, McGraw-Hill, New York,1966.
11. S. Willard, General Topology, Addison-Wesley, Reading, 1970.
12. Crump W.Baker, Introduction to Topology, Wm C. Brown Publisher, 1991.
13. Sze-Tsen Hu, Elements of General Topology, Holden-Day,Inc.1965.
14. D. Bushaw, Elements of General Topology, John Wiley & Sons, New York, 1963.
15. M. J. Mansfield, Introduction to Topology, D.Van Nostrand Co. Inc.Princeton,N.J.,1963.
16. B. Mendelson, Introduction to Topology, Allyn & Bacon, Inc., Boston,1962.
17. C. Berge, Topological Spaces, Macmillan Company, New York,1963.
18. S. S. Coirns, Introductory Topology, Ronald Press, New York, 1961.
19. Z. P. Mamuzic, Introduction to General Topology, P. Noordhoff Ltd.,Groningen, 1963.
20. K. K. Jha, Advanced General Topology, Nav Bharat Prakashan, Delhi.

M.Sc./M.A. Course (Second Semester)
PAPER-IV

Advanced Complex Analysis (II)

Max. Marks 80

Unit-I Weierstrass' factorisation theorem. Gamma function and its properties. Riemann Zeta function. Riemann's functional equation. Runge's theorem. Mittag-Leffler's theorem.

Unit-II Analytic Continuation. Uniqueness of direct analytic continuation. Uniqueness of analytic continuation along a curve. Power series method of analytic continuation Schwarz Reflection Principle. Monodromy theorem and its consequences.

Unit-III Harmonic functions on a disk. Harnack's inequality and theorem. Dirichlet Problem. Green's function.

Unit-IV Canonical products. Jensen's formula. Poisson-Jensen formula. Hadamard's three circles theorem. Order of an entire function. Exponent of Convergence. Borel's theorem. Hadamard's factorization theorem.

Unit-V The range of an analytic function. Bloch's theorem. The Little Picard theorem. Schottky's theorem. Montel Caratheodory and The Great Picard theorem. Univalent functions. Bieberbach's conjecture (Statement only) and the "1/4-theorem.

Recommended Books:

1. L. V. Ahlfors, Complex Analysis, MCGraw - Hill, 1979.
2. J. B. Conway, Functions of one Complex variable, Springer-Verlag, International student-Edition, Narosa Publishing House,1980.

References

1. H. A. Priestly, Introduction to Complex Analysis, Clarendon Press, Oxford 1990.
2. Liang-shin Hahn & Bernard Epstein, Classical Complex Analysis, Jones and Bartlett Publishers International, London, 1996.
3. S. Lang, Complex Analysis, Addison Wesley, 1977.
4. Mark J.Ablowitz and A.S. Fokas, Complex Variables: Introduction and Applications, Cambridge University press, South Asian Edition, 1998.
5. E. Hille, Analytic Function Theory (2 Vols.) Gonn & Co., 1959.
6. W. H. J. Fuchs, Topics in the Theory of Functions of one Complex Variable, D.Van Nostrand Co., 1967.
7. C. Caratheodory, Theory of Functions (2 Vols.) Chelsea Publishing Company, 1964.
8. M. Heins, Complex Function Theory, Academic Press, 1968.
9. Walter Rudin, Real and Complex Analysis, McGraw-Hill Book Co., 1966.
10. S. Saks and A. Zygmund, Analytic Functions, Monografic Matematyczne, 1952.
11. E.C Titchmarsh, The Theory of Functions, Oxford University Press, London.
12. W. A. Veech, A Second Course in Complex Analysis, W.A. Benjamin, 1967.
13. S. Ponnusamy, Foundations of Complex Analysis, Narosa Publishing House, 1997.
14. D. Sarason, Complex Function Theory, Hindustan Book Agency, Delhi, 1994.

M.Sc./M.A. Course (Second Semester)

PAPER-V

Advanced Discrete Mathematics (II)

Max. Marks 80

Unit-I Graph Theory-Definition of (Undirected) Graphs, Paths, Circuits, Cycles, & Subgraphs. Induced Subgraphs. Degree of a vertex. Connectivity. Planar Graphs and their properties. Trees. Euler's Formula for connected planar Graphs. Complete & Complete Bipartite Graphs. Kuratowski's Theorem (statement only) and its use.

Unit-II Spanning Trees, Cut-sets, Fundamental Cut -sets, and Cycle. Minimal Spanning Trees and Kruskal's Algorithm. Matrix Representations of Graphs. Euler's Theorem on the Existence of Eulerian Paths and Circuits.

Unit-III Directed Graphs. In degree and Out degree of a Vertex. Weighted undirected Graphs. Dijkstra's Algorithm.. strong Connectivity & Warshall's Algorithm. Directed Trees. Search Trees. Tree Traversals.

Unit-IV Introductory Computability Theory-Finite State Machines and their Transition Table Diagrams. Equivalence of finite State Machines. Reduced Machines. Homomorphism.

Unit-V Finite Automata. Acceptors. Non-deterministic Finite Automata and equivalence of its power to that of Deterministic Finite Automata. Moore and mealy Machines. Turing Machine and Partial Recursive Functions.

Recommended Books:

1. Elements of Discrete Mathematics By C. L. Liu
2. Graph Theory and its application By N. Deo
3. Theory of Computer Science By K. L. P. Mishra and N. Chandrashekaran

References

1. J. P. Tremblay & R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill Book Co., 1997.
2. J. L. Gersting, Mathematical Structures for Computer Science, (3rd edition), Computer Science Press, New York.
3. Seymour Lepschutz, Finite Mathematics (International) edition 1983), McGraw-Hill Book Company, New York.
4. S. Wiitala, Discrete Mathematics-A Unified Approach, McGraw-Hill Book Co.
5. J. E. Hopcroft and J. D. Ullman, Introduction to Automata Theory, Languages & Computation, Narosa Publishing House.
6. C.L Liu, Elements of Discrete Mathematics, McGraw-Hill Book Co.
7. N. Deo. Graph Theory with Application to Engineering and Computer Sciences. Prentice Hall of India.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.A./M.Sc. (MATHEMATICS) (Semester-III)
2020-21 & Onward

There shall be five theory papers. Two compulsory and three optional. Each paper shall have 100 marks. Out of these five papers, the paper which has theory and practical both, the theory part shall have 70 marks and practical part shall have 30 marks. **Overall tally of marks in theory and practical will be 500.**

Paper		Description	Theory	Sessional	Practical	Remark
Compulsory Papers						
I		Integration Theory and Functional Analysis (I)	80	20	--	--
II		Partial Differential Equations & Mechanics (I)	80	20	--	--
Optional Papers						
III	A	Fundamentals of Computer Science (Object Oriented Programming and Data Structure)	70	--	30	For regular students only
	B	General Relativity and Cosmology (I)	80	20	--	--
	C	Fuzzy Set Theory & Its Applications (I)	80	20	--	--
	D	Mathematical Biology (I)	80	20	--	--
IV	A	Operations Research (I)	80	20	--	--
	B	Wavelets (I)	80	20	--	--
V	A	Programming in C (with ANSI Features) (I)	70	--	30	For regular students only
	B	Graph Theory (I)	80	20	--	--
	C	Algebraic Number Theory (I)	80	20	--	--

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.Sc./M.A. Course (Third Semester)

PAPER -I

Integration Theory and Functional Analysis (I)

Max. Marks 80

Integration Theory:

Unit-I Signed measure. Hahn decomposition theorem, mutually singular measures. Radon-Nikodym theorem. Labesgue decomposition. Riesz representation theorem. Extension theorem (Caratheodory).

Unit-II Lebesgue-Stieltjes integral, product measures, Fubini's theorem. Differentiation and Integration. Decomposition into absolutely continuous and singular parts.

Unit-III Baire sets. Baire measure, continuous functions with compact support. Regularity of measures on locally compact spaces. Integration of continuous functions with compact support, Riesz-Markoff theorem.

Functional Analysis :

Unit-IV Normed linear spaces. Banach spaces and examples. Quotient space of normed linear spaces and its completeness, equivalent norms. Riesz Lemma, basic properties of finite dimensional normed linear spaces and compactness.

Unit-V Weak convergence and bounded linear transformations, normed linear spaces of bounded linear transformations, dual spaces with examples.

Books Recommended :

1. P. R. Halmos, Measure Theory, Van Nostrand, Princeton, 1950.
2. B. Choudhary and S.Nanda, Functional Analysis with Applications. Wiley Eastern Ltd. 1989.
3. H. L. Royden, Real Analysis, Macmillan Publishing Co. Inc., New York, 4'h Edition, 1993.

References

1. S. K. Berberian, Measure and integration, Chelsea Publishing Company, New York, 1965.
2. G. de Barra, Measure Theory and Integration, Wiley Eastern Limited, 1981.
3. P. K. Jain and V.P. Gupta, Lebesgue Measure and Integration, New Age International (P) Limited, New Delhi, 2000.
4. Richard L. Wheeden and Antoni Zygmund, Measure and Integral : An Introduction to Real Analysis, Marcel Dekker Inc. 1977.
5. J. H. Williamson, Lebesgue Integration, Holt Rinehart and Winston, Inc. New York. 1962.
6. T. G. Hawkins, Lebesgue's Theory of Integration: Its Origins and Development, Chelsea, New York, 1979.
7. K. R. Parthasarathy, Introduction to Probability and Measure, Macmillan Company of India Ltd., Delhi, 1977.
8. R. G. Bartle, The Elements of Integration, John Wiley & Sons, Inc. New York, 1966.
9. Serge Lang, Analysis I & II, Addison-Wesley Publishing Company, Inc. 1967.
10. Inder K. Rana, An Introduction to Measure and Integration, Narosa Publishing House, Delhi, 1997.
11. Walter Rudin, Real & Complex Analysis, Tata McGraw-Hill Publishing.
12. Edwin Hewitt and Korl Stromberg, Real and Abstract Analysis, Springer-Verlag, New York.
13. Edwin Hewitt and Kenneth A. Ross, Abstract Harmonic Analysis, Vol. 1, Springer-Verlag, 1993.
14. G. Bachman and L. Narici, Functional Analysis, Academic Press, 1966.
15. N. Dunford and J.T. Schwartz, Linear Operators, Part I, Interscience, New York, 1958.
16. R. E. Edwards, Functional Analysis, Holt Rinehart and Winston, New York, 1965.
17. C. Goffman and G. Pedrick, First Course in Functional Analysis, Prentice Hall of India, New Delhi, 1987.
18. P. K. Jain, O.P. Ahuja and Khalil Ahmad, Functional Analysis, New Age International (P) Ltd. & Wiley Eastern Ltd., New Delhi, 1997.
19. R. B. Holmes, Geometric Functional Analysis and its Applications, Springer-Verlag, 1975.
20. K.K. Jha, Functional Analysis, Students' Friends, 1986.
21. L. V. Kantorovich and G.P. Akilov, Functional Analysis, Pergamon Press, 1982.
22. E. Kreyszig, Introductory Functional Analysis with Applications, John Wiley & Sons, New York, 1978.
23. B. K. Lahiri, Elements of Functional Analysis, The World Press Pvt. Ltd., Calcutta, 1994.
24. A. H. Siddiqui, Functional Analysis with Applications, Tata McGraw-Hill Publishing Company Ltd. New Delhi

25. B. V. Limaye, Functional Analysis, Wiley Eastern Ltd.
26. L. A. Lustenik and V.J. Sobolev, Elements of Functional Analysis, Hindustan Publishing Corporation, New Delhi, 1971.
27. G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill Book Company, New York, 1963.
28. A. E. Taylor, Introduction to Functional Analysis, John Wiley and Sons, New York, 1958.
29. K. Yosida, Functional Analysis, 3'" edition Springer-Verlag, New York, 1971.
30. J. B. Conway, A Course in Functional Analysis, Springer-Verlag, New York, 1990.
31. Walter Rudin, Functional Analysis, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 1973.
32. A. Wilansky, Functional Analysis, Blaisdell Publishing Co., 1964.
33. J. Tinsley Oden & Leszek F. Dernkowicz, Applied Functional Analysis, CRC Press Inc., 1996.

M.Sc./M.A. Course (Third Semester)

PAPER -II

Partial Differential Equations and Mechanics (I)

Max. Marks 80

Partial Differential Equations

Unit-I Examples of PDE. Classification. Transport Equation-Initial value Problem. Non-homogeneous Equation, Laplace's Equation-Fundamental Solution, Mean Value Formulas, Properties of Harmonic Functions, Green's Function, Energy Methods.

Unit-II Heat Equation-Fundamental Solution, Mean Value Formula, Properties of Solutions, Energy Methods. Wave Equation-Solution by Spherical Means, Non-homogeneous Equations, Energy Methods.

Analytical Dynamics:

Unit-III Generalized coordinates. Holonomic and Non-holonomic systems. Scleronomic and Rheonomic sytems. Generalized potential. Lagrange's equations of first kind. Lagrange's equations of second kind. Uniqueness of solution. Energy equation for conservative fields. Hamilton's variables. Donkin's theorem. Hamilton canonical equations. Cyclic coordinates. Routh's equations.

Unit-IV Poisson's Bracket. Poisson's Identity. Jacobi-Poisson Theorem. Motivating problems of calculus of variations, Shortest distance. Minimum surface of revolution. Brachistochrone problem. Isoperimetric problem. Geodesic. Fundamental lemma of calculus of variations. Euler's equation for one dependent function and its generalization to (i) 'n' dependent functions, (ii) higher order derivatives. Conditional extremum under geometric constraints and under integral constraints.

Gravitation:

Unit-V Attraction and potential of rod, disc, spherical shells and sphere. Surface integral of normal attraction (application & Gauss' theorem). Laplace and Poisson equations. Work done by self attracting systems. Distributions for a given potential. Equipotential surfaces. Surface and solid harmonics. Surface density in terms of surface harmonics.

Books Recommended:

1. L. C. Evans, Partial Differential Equations, Graduate Studies in Mathematics, Volume 19, AMS, 1998.
2. F. Gantmacher, Lectures in Analytic Mechanics, MIR Publishers, Moscow, 1975.
3. R. C.Mondal, Classical Mechanics, Prentice Hall of India
4. S. L. Loney, An Elementary Treatise on Statics, Kalyani Publishers, New Delhi, 1979.

References

1. Books on Partial differential equation by 1.N. Sneddon, F. John, P. Prasad and R. Ravindran, Amarnath etc.
2. A. S. Ramsey, Dynamics Part II, The English Language Book Society and Cambridge University Press, 1972.
3. H. Goldstein, Classical Mechanics (2nd edition), Narosa Publishing House, New Delhi.
4. I. M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice Hall.
5. Narayan Chandra Rana & Pramod Sharad Chandra Joag, Classical Mechanics, Tata McGraw Hill, 1991.
6. Louis N. Hand and Janet D. Finch, Analytical Mechanics, Cambridge University Press, 1998.
7. A. S. Ramsey, Newtonian Gravitation, The English Language Book Society and the Cambridge University Press.

M.Sc./M.A. Course (Third Semester)

PAPER-III (A)

Fundamentals of Computer Science-Theory and Practical (Object Oriented Programming and Data Structure)

Max. Marks. 100

(Theory-70 +Practical-30)

Unit-I Object Oriented Programming-Classes and Scope, nested classes, pointer class members; Class initialization, assignment and destruction.

Unit-II Overloaded functions and operators; Templates including class templates; class inheritance and virtual functions.

Unit-III Data Structures-Analysis of algorithms, q, W, 0, o, w notations ; Sequential and linked representations, Lists, Stacks, and queues;

Unit-IV Trees: Binary tree- search tree implementation, B-tree (concept only);

Unit-V Sorting: Insertion sort, shell sort, quick-sort, heap sort and their analysis; Hashing-open and closed.

Books Recommended :

1. S. B. Lipman, J. Lajoi: C++ Primer, Addison Wesley.
2. B. Stroustrup; The C++ Programming Language, Addison Wesley.
3. C. J. Date : Introduction to Database Systems, Addison Wesley.
4. C. Ritehie: Operating Systems-Incorporating UNIX and Windows, BPB Publications.
5. M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley.

Practical Examination Scheme

Max. Marks – 30	Time Duration – 3 Hrs.
Practical (two)	20 Marks(10 marks each)
Viva	05 Marks
Sessional	05 Marks

M.Sc./M.A. Course (Third Semester)

PAPER-III (B)

General Relativity & Cosmology (I)

Max Marks – 80

Unit-I General Relativity-Transformation of coordinates. Tensors. Algebra of Tensors. Symmetric and skew symmetric Tensors. Contraction of tensors and quotient law. Reimannian metric. Parallel transport. Christoffel Symbols. Covarient derivatives, intrinsic derivatives and geodesies.

Unit-II Riemann Christoffel curvature tensor and its symmetry properties. Bianchi identities and Einstein tensor. Review of the special theory of relativity and the Newtonian Theory of gravitation.

Unit-III Principle of equivalence and general covariance, geodesic principle, Newtonian approximation of relativistic equations of motion. Einstein's field equations and its Newtonian approximation.

Unit-IV Schwarzschild external solution and its isotropic form. Planetary orbits and anologues of Kepler's Laws in general relativity. Advance of perihelion of a planet. Bending of light rays in a gravitational field, vitational redshift of spectral lines. Radar echo delay.

Unit-V Energy-momentum tensor of a perfect fluid. Schwarzschild internal solution. Boundary conditions. Energy momentum tensor of an electromagnetic field. Einstein-Maxwell equations. Reissner-Nordstrfim solution.

REFERENCES:

1. C. E. Weatherbum, An Introduction to Riemannian Geometry and the lensor Calculus, Cambridge University Press, 1950.
2. H. Stepheni, General Relativity: An Introduction to the theory of the gravitational field, Cambridge University Press, 1982.
3. A. S. Eddinglon, The Mathematical Theory of Relativity, Cambridge University Press, 1965.
4. J. V. Narlikar, General Relativity and Cosmology, The Macmillan Company of India Limited, 1978.
5. R. Adiev, M. Bazin, M. Schiffer, Introduction to general relativity, McGraw Hill Inc., 1975.
6. B. F. Shutz, A first course in general relativity, Cambridge University Press,1990.
7. S. Weinberg, Gravitation and Cosmology: Principles and applications of the general theory of relativity, John Wiley & Sons, Inc. 1972.
8. R. K. Sachs and H. Wu., General Relativity for Mathematician, Springer Verlag, 1977.
9. J. L. Synge, Relativity: The general theory. North Holland Publishing Company, 1976.

M.Sc./M.A. Course (Third Semester)

PAPER-III (C)

Fuzzy Set Theory and Its Applications (I)

Max Marks – 80

UNIT-I Fuzzy sets-Basic definitions, α-level sets. Convex fuzzy sets. Basic operations on fuzzy sets. Types of fuzzy sets. Cartesian products, Algebraic products. Bounded sum and difference, t-norms and t-conorms.

UNIT-II The Extension Principle- The Zadeh's extension principle. Image and inverse image of fuzzy sets. Fuzzy numbers. Elements of fuzzy arithmetic.

UNIT-III Fuzzy Relations on Fuzzy sets, Composition of Fuzzy relations. Min-Max composition and its properties.

UNIT-IV Fuzzy equivalence relations. Fuzzy compatibility relations. Fuzzy relation equations. Fuzzy graphs, Similarity relation.

UNIT-V Possibility Theory-Fuzzy measures. Evidence theory. Necessity measure. Possibility measure. Possibility distribution. Possibility theory and fuzzy sets. Possibility theory versus probability theory.

REFERENCES :

1. H. J. Zmmemann, Fuzzy set theory and its Applications, Allied Publishers Ltd. New Delhi, 1991.
2. G. J. Klir and B. Yuan- Fuzzy sets and fuzzy logic, Prentice-Hall ol India, New Delhi, 1995.

M.Sc./M.A. Course (Third Semester)
PAPER-III (D)
Mathematical Biology (I)

Max. Marks - 80

UNIT-I

Population Dynamics

Malthusian growth model, Logistic equation, model of species competition, Linear and Nonlinear First Order Discrete Time Models, Biology of Insect Population Dynamics, Model for Insect Population Dynamics with Competition, Differential Equation Models.

UNIT-II

Age Structured Population Dynamics

Evolutionary Aspects, Harvesting and Fisheries, Metapopulations, Delay Effects, Fibonacci's Rabbits, golden ratio, Age-structured Population's in Discrete Time, continuous age-structured populations, Euler-Lotka Equations.

UNIT-III

Population Dynamics of Interacting Species

Host-parasitoid Interactions, Lotka-Volterra Prey-predator Equations, Modelling the Predator Functional Response, Ecosystems Modelling, Interacting Metapopulations, Competition, Predation, Predator-mediated Coexistence of Competitors, Effects of Habitat Destruction.

UNIT-IV

Population Genetics and Evolution

Mendelian Genetics in Populations with Non-overlapping Generations, Haploid genetics, Spread of a favored allele, Mutation-selection balance, Diploid genetics, Sexual reproduction, Spread of a favored allele, Mutation-selection balance, Heterosis, Frequency-dependent selection, Linkage equilibrium, Random genetic drift, Evolution of the Genetic System.

UNIT-V

Infectious Disease

Simple Epidemic and SIS Diseases, SIR Epidemics, SIR epidemic disease model, SIR Endemics, SIR endemic disease model, No Disease-related Death, Including Disease- related Death, Vaccination, Evolution of virulence, Vector -borne Diseases, Basic Model for Macroparasitic Diseases.

Recommended Books

1. Jeffrey R. Chasnov, Mathematical Biology, Lecture Notes for MATH(365), The Hong Kong University of Science and Technology (2010)
2. Nicholas F. Britton, Essential Mathematical Biology, Springer-Verlag (2003)
3. J.D.Murray, Mathematical Biology I. An Introduction, Springer-Verlag (2002) 3rd Edition.
4. J. D. Murray, Mathematical Biology II. Spatial Models and Biomedical Application, Springer-Verlag (2003) 3rd Edition.

M.Sc./M.A. Course (Third Semester)

PAPER –IV (A)

Operations Research (I)

Max. Marks 80

Unit-I Operations Research and its Scope. Necessity of Operations Research in Industry. Linear Programming-Simplex Method. Theory of the Simplex Method. Duality and Sensitivity Analysis.

Unit-II Other Algorithms for Linear Programmrng-Dual Simplex Method.

Unit-III Parametric Linear Programming. Upper Bound Technique. Interior Point Algorithm. Linear Goal Programming.

Unit-IV Transportation and Assignment Problems.

Unit-V Network Analysis-Shortest Path Problem. Minimum Spanning Tree Probiem. Maximum Flow I Problem. Minimum Cost Flow Problem. Network Simplex Method. Project Planning and Control I with PERT-CPM.

Books Recommended :

1. F. S. Hillier and G.J. Ueberman. Introduction to Operations ResBareft (Sixth Edition), McGraw Hill International Edition, Industrial Engineering Series, 1995. (This book comes with a CD containing tutorial software).
2. G. Hadley, Linear Programming, Narosa Publishing House, 1995.
3. G. Hadly, Nonlinear and Dynamic Programming, Addison-Wesley, Reading Mass.
4. H. A. Taha, Operations Research -An introduction, Macmillan Publishing Co., Inc., New Yark.
5. Kanti Swarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand & Sons, New Delhi
6. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network flows, John Wiley & Sons, New York, 1990.

References

1. S. S. Rao, Optimization Theory and Applications, Wiley Eastern Ltd., New Delhi.
2. Prem Kumar Gupla and D.S. Hira, Operations Research-An Introduction. S. Cliand & Company Ltd., New Delhi.
3. N. S. Kambo, Mathematical Programming Techniques, Affiliated East-West Press Pvt. Ltd., New Delhi, Madras
4. R. K. Rathy, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
5. A. D. Young, Boundary Layers, AIAA Education Series, Washington DC, 1989.
6. S. W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.
7. LINGO Systems Products (Visit websHe htlp://www.Hndo.com/productsf.html)
   (i) LINGO (the linear programming solver)
   (ii) LINGO Callable Library (the premier optimisation engine)
   (iii) LINGO (the linear, non-linear, and integer programming solver with mathematical modelling language)
   (i) What's Best I (the spreadssheet add-in that solves linear, non- linear, and integer problems).

   All the above four products are bundled into one package to form the Solver Suite. For more details about any of the four products one has to click on its name.
   (i) Optimisation Modelling with LINGO (8" edition) by Linus Schrage.
   (ii) Optimisation Modelling with LINGO by Unus Schrage.
   More details available on the Related Book page York, 1979.

M.Sc./M.A. Course (Third Semester)
PAPER-IV (B)
Wavelets (I)

Max Marks – 80

Unit-I. Preliminaries-Different ways of constructing wavelets- Orthonormal bases generated by a single function: the Balian-Low theorem. Smooth projections on $L^2(R)$.

Unit-II. Local sine and cosine bases and the construction of some wavelets. The unitary folding operators and the smooth projections.

Unit-III. Multiresolution analysis and construction of wavelets. Construction of compactly supported wavelets and estimates for its smoothness. Band limited wavelets.

Unit-IV. Orthonormality. Completeness. Characterization of Lemarie-Meyer wavelets and some other characterizations. Franklin wavelets and Spline wavelets on the real line.

Unit-V. Orthonormal bases of piecewise linear continuous functions for L^2 (T). Orthonormal bases of periodic splines. Periodization of wavelets defined on the real line.

REFERENCES:

1. Eugenic HernBndez and Guido Weiss, A First Course on Wavelets, CRC Press, New York, 1996.
2. C. K. Chui, An Introduction to Wavelets, Academic Press, 1992.
3. I. Daubechies, Ten Lectures on Wavelets, CBS-NSF Regional Conferences in Applied Mathematics, 61, SIAM, I 1992.
4. Y. Meyer,Wavelets, algorithms and applications (Tran.by R.D. Rayan,SIAM, 1993.
5. M. V. Wickerhauser, Adapted wavelet analysis from theory to software, Wellesley, MA, A.K. Peters, 1994.

M.Sc./M.A. Course (Third Semester)

PAPER –V (A)

Programming in C (with ANSI features) Theory and Practical (I)

Max. Marks. 100

(Theory-70 +Practical-30)

Unit-I An overview of programming. Programming language, Classification. C Essentials-Program Development. Functions. Anatomy of a C Function. Variables and Constants. Expressions. Assignment Statements. Formatting Source Files. Continuation Character. The Preprocessor.

Unit-II Scalar Data Types-Declarations, Different Types of Integers. Different kinds of Integer Constants. Floating-Point Types. Initialization. Mixing Types. Explicit Conversions-Casts. Enumeration Types. The Void Data Type. Typedefs. Finding the Address of an object. Pointers.

Unit-III Control Flow-Conditional Branching. The Switch Statement. Looping. Nested Loops. The break and continue Statements. The goto statement. Infinite Loops.

Unit-IV Operators and Expressions-Precedence and Associativity. Unary Plus and Minus operators. Binary Arithmetic Operators. Arithmetic Assignment Operators. Increment and Decrement Operators. Comma Operator. Relational Operators. Logical Operators. Bit - Manipulation Operators. Bitwise Assignment Operators. Cast Operator. Size of Operators. Conditional Operator. Memory Operators.

Unit-V Arrays -Declaring an Array. Arrays and Memory. Initializing Arrays. Encryption and Decryption.

Books Recommended :

1. Peter A. Darnell and Philip E. Margolis, C: A Software Engineering Approach, Narosa Publishing House (Springer International Student Edition) 1993.
2. Samuel P. Harkison and Gly L. Steele Jr., C : A Reference Manual, 2nd Edition, Prentice Hall, 1984.
3. Brian W. Kernighan & Dennis M. Ritchie, The C Programme Language, 2nd Edition (ANSI Features), Prentice Hall 1989.

Practical Examination Scheme

Max. Marks – 30	Time Duration – 3 Hrs.
Practical (two)	20 Marks(10 marks each)
Viva	05 Marks
Sessional	05 Marks

M.Sc./M.A. Course (Third Semester)

PAPER-V (B)

Graph theory (I)

Max. Marks - 80

Unit-I: Operations on graphs, matrices and vector spaces: Topological operations, Homeomerphism, homomorphism, contractions, derived graphs, Binary operations.

Unit-II: Matrices and vector spaces: Matrices and vector spaces : The adjacency matrix, The determinant and the spectrum, Spectrum properties, The incidence matrix, cycle space and Bond space, Cycle bases and cycle graphs.

Unit-III: Colouring packing and covering: Vertex coverings, critical graphs, Girth and chromatic number, uniquely colourable graphs, edge-colourings, Face colourings and Beyond, The achromatic and the Adjoint Numbers.

Unit-IV: Combinational formulations: Setting up of combinational formulations, the classic pair of duals, Gallai, Norman-Rabin Theorems, Clique parameters, The Rosenfeld Numbers.

Unit-V: Perfect Graphs: Introduction to the "SPGC", Triangulated (Chordal) graphs, Comparability graphs, Interval graphs, permutation graphs, circular arc graphs, split graphs, weakly triangulated graphs.

REFERENCES :

1. K. R. Parthasarathy, Basic graph theory, Tata Mc graw Hill publishing company limited , 1994.
2. R. J. Wilson, Introduction to graph theory, Longman Harlow, 1985.
3. John Clark, Derek Allon Holton, A first look at graph Theory, World Scientific Singapore, 1991.
4. Frank Hararary, Graph Theory Narosa, New Delhi, 1995.
5. Ronald Gould and Benjamin Cummins, Graph Theory, California.
6. Narsingh Deo, Graph Theory with applications to Engineering and Computer Science, Prentice-Hall of India Private Limited, New Delhi, 2002.

M.Sc./M.A. Course (Third Semester)
PAPER-V (C)
Algebraic Number Theory (I)

Max Marks – 80

UNIT-I

Elementary Number Theory: Primes and factorization, Division Algorithm, Congruence, Congruence and Modular Arithmetic, Euler phi function, Primitive roots of Unity, Quadratic law of Reciprocity, Arithmetical functions, Mobius Inversion Formula, The Diophantine Equations, Farey Sequences.

UNIT-II

Algebraic Numbers: Algebraic Numbers, Conjugates and Discriminants, Algebraic Integers, Integral Bases, Rings of Integers.

UNIT-III

Special Fields: Calculations for Quadratic fields, cubic fields, biquadratic fields and sextic fields.

UNIT-IV

Localization: Localization, Integral closure, Prime ideals, Chinese remainder theorem, Galois extensions. **Rings:** Dedekind rings, Discrete valuation rings, Explicit factorization of a prime.

UNIT-V

Completions: Definitions and completions, Polynomials in complete fields, Structure of complete discrete valuation ring, extension of complete fields.

References:

1. Serge Lange: Algebraic Number Theory, Springer-Verlag, 1986.
2. Jean-Pierre Serre: Local Fields, Springer-Verlag, 1979
3. M. Ram Murty, Jody Esmonde: Problems in Algebraic Number Theory (2nd ed.), Springer, 2005.
4. H. P. F. Swinnerton-Dyer: A Brief Guide to Algebraic Number Theory, Cambridge University Press, 2001
5. A. Frohlich , M.J. Taylor: Algebraic Number Theory, Cambridge University Press, 1991.
6. Ian Stewart, David Tall : Algebraic Number Theory and Fermat's Last Theorem (3rd ed.), A K Peters, Natick, Massachusetts, 2002.
7. Ethan D. Bolker: Elementary Number Theory, An Algebraic Approach, W. A. Benjamin, Inc., New York, 1970
8. Jurgen Neukirch: Algebraic Number Theory, Springer-Verlag, 1999
9. William Stein: Algebraic Number Theory, a Computational Approach, Cambridge University Press, 1991.
10. G. A. Jones and J. M. Jones, Elementary Number Theory, Springer, 1998.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

M.A./M.Sc. (MATHEMATICS) (Semester-IV)

2020-21 & Onward

There shall be five papers. Two compulsory and three optional papers. Each paper shall have 100 marks. The paper which has theory and practical both, the theory part shall have 70 marks and practical part shall have 30 marks. **Overall tally of marks in theory and practical will be 500.**

Paper		Description	Theory	Sessional	Practical	Remark
Compulsory Papers						
I		Functional Analysis (II)	80	20	--	--
II		Partial Differential Equations & Mechanics	80	20	--	--
Optional Papers						
III	A	Operating System and Database Management System	70	--	30	For regular students
	B	Cosmology (II)	80	20	--	--
	C	Fuzzy Set Theory & Its Applications	80	20	--	--
	D	Mathematical Biology(II)	80	20	--	--
IV	A	Operations Research (II)	80	20	--	--
	B	Wavelets (II)	80	20	--	--
V	A	Programming in C (with ANSI Features) (II)	70	--	30	For regular students
	B	Graph Theory (II)	80	20	--	
	C	Algebraic Number Theory	80	20	--	

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

M.Sc./M.A. Course (Fourth Semester)

PAPER -I

Functional Analysis (II)

Max. Marks 80

Unit-I Uniform boundedness theorem and some its consequences. Open mapping and closed graph theorems.

Unit-II Hahn-Banach theorem for real linear spaces, complex linear spaces and normed linear spaces. Reflexive spaces. Weak Sequential Compactness. Compact Operators. Solvability of linear equations in Banach spaces. The closed Range Theorem.

Unit-III Inner product spaces. Hilbert spaces. Orthonormal Sets. Bessel's inequality. Complete orthonormal sets and Parseval's identity.

Unit-IV Structure of Hilbert spaces. Projection theorem. Riesz representation theorem. Adjoint of an operator on a Hilbert space. Reflexivity of Hilbert spaces.

Unit-V Self-adjoint operators, Positive, projection, normal and unitary operators. Abstract variational boundary-value problem. The generalized Lax-Milgram theorem.

Books Recommended :

1. B. Choudhary and S. Nanda, Functional Analysis with Applications. Wiley Eastern Ltd. 1989.
2. H. L. Royden, Real Analysis, Macmillan Publishing Co. Inc., New York, 4th Edition, 1993.

References

1. Serge Lang, Analysis I & II, Addison-Wesley Publishing Company, Inc. 1967.
2. Walter Rudin, Real & Complex Analysis, Tata McGraw-Hill Publishing.
3. Edwin Hewitt and Korl Stromberg, Real and Abstract Analysis, Springer-Verlag, New York.
4. Edwin Hewitt and Kenneth A. Ross, Abstract Harmonic Analysis, Vol. 1, Springer-Verlag, 1993.

5. G. Bachman and L. Narici, Functional Analysis, Academic Press, 1966.
6. N. Dunford and J.T. Schwartz, Linear Operators, Part I, Interscience, New York, 1958.
7. R. E. Edwards, Functional Analysis, Holt Rinehart and Winston, New York, 1965.
8. C. Goffman and G. Pedrick, First Course in Functional Analysis, Prentice Hall of India, New Delhi, 1987.
9. P. K. Jain, O.P. Ahuja and Khalil Ahmad, Functional Analysis, New Age International (P) Ltd. & Wiley Eastern Ltd., New Delhi, 1997.
10. R. B. Holmes, Geometric Functional Analysis and its Applications, Springer-Verlag, 1975.
11. K. K. Jha, Functional Analysis, Students' Friends, 1986.
12. L. V. Kantorovich and G.P. Akilov, Functional Analysis, Pergamon Press, 1982.
13. E. Kreyszig, Introductory Functional Analysis with Applications, John Wiley & Sons, New York, 1978.
14. B. K. Lahiri, Elements of Functional Analysis, The World Press Pvt. Ltd., Calcutta, 1994.
15. A. H. Siddiqui, Functional Analysis with Applications, Tata McGraw-Hill Publishing Company Ltd. New Delhi
16. B.V. Limaye, Functional Analysis, Wiley Eastern Ltd.
17. L.A. Lustenik and V.J. Sobolev, Elements of Functional Analysis, Hindustan Publishing Corporation, New Delhi, 1971.
18. G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill Book Company, New York, 1963.
19. A. E. Taylor, Introduction to Functional Analysis, John Wiley and Sons, New York, 1958.
20. K.Yosida, Functional Analysis, 3'" edition Springer-Verlag, New York, 1971.
21. J.B. Conway, A Course in Functional Analysis, Springer-Verlag, New York, 1990.
22. Walter Rudin, Functional Analysis, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 1973.
23. A. Wilansky, Functional Analysis, Blaisdell Publishing Co., 1964.
24. J. Tinsley Oden & Leszek F. Demkowicz, Applied Functional Analysis, CRC Press Inc., 1996.

M.Sc./M.A. Course (Fourth Semester)

PAPER -II

Partial Differential Equations and Mechanics (II)

Max. Marks 80

Partial Differential Equations

Unit-I Non-linear First Order PDE-Complete Integrals, Envelopes, Characteristics, Hamilton Jacobi Equations (Calculus of Variations, Hamilton's ODE, Legendre Transform, Hopf-Lax Formula, Weak Solutions, Uniqueness), Conservation Laws (Shocks, Entropy Condtion, Lax Oleinik formula, Weak Solutions, Uniqueness, Riemann's Problem, Long Time Behaviour)

Unit-II Representation of Solutions-Separation of Variables, Similarity Solutions (Plane and Travelling Waves, Solitons, Similarity under Scaling), Fourier and Laplace Transform, Hopf-Cole Transform, Hodograph and Legendre Transforms, Potential Functions.

Unit-III Asymptotics (Singular Perturbations, Laplace's Method, Geometric Optics, Stationary Phase, Homogenization), Power Series (Non-characteristic Surfaces, Real Analytic Functions, Cauchy-Kovalevskaya Theorem).

Analytical Dynamics:

Unit-IV Hamilton's Principle. Principle of least action. Poincare Cartan Integral invariant. Whittaker's equations. Jacobi's equations. Lee Hwa Chung's theorem, canonical transformations and properties of generating functions.

Unit-V Hamilton-Jacobi equation. Jacobi theorem. Method of separation of variables. Lagrange Brackets. Condition of canonical character of a transformation in terms of Lagrange brackets and Poisson brackets, invariance of Lagrange brackets and Poisson brackets under canonical transformations.

Books Recommended :

1. L. C. Evans, Partial Differential Equations, Graduate Studies in Mathematics, Volume 19, AMS, 1998.
2. F. Gantmacher, Lectures in Analytic Mechanics, MIR Publishers, Moscow, 1975.
3. R. C. Mondal, Classical Mechanics, Prentice Hall of India

References

1. Books on Partial differential equation by IN. Sneddon, F. John, P. Prasad and R. Ravindran, Amarnath etc.
2. A. S. Ramsey, Dynamics Part II, The English Language Book Society and Cambridge University Press, 1972.
3. H. Goldstein, Classical Mechanics (2nd edition), Narosa Publishing House, New Delhi.
4. I. M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice Hall.
5. Narayan Chandra Rana & Pramod Sharad Chandra Joag, Classical Mechanics, Tata McGraw Hill, 1991.
6. Louis N. Hand and Janet D. Finch, Analytical Mechanics, Cambridge University Press, 1998.

M.Sc./M.A. Course (Fourth Semester)

PAPER-III (A)

Operating System and Database Management System - Theory and Practical

Max. Marks. 100

(Theory-70 +Practical-30)

Unit-I Database Systems-Role of database systems, database system architecture and data modeling.

Unit-II Introduction to relational algebra and relational calculus.

Unit-III Intoduction to SQL: Basic features in cluding views; Integrity constraints; Database design-normalization up to BCNF.

Unit-IV Operating Systems- Overview of operating system, user interface, processor management, memory management.

Unit-V I/O management, concurrency and Security, network and distributed systems.

Books Recommended :

1. S. B. Lipman, J. Lajoi: C++ Primer, Addison Wesley.
2. B. Stroustrup; The C++ Programming Language, Addison Wesley.
3. C. J. Date : Introduction to Database Systems, Addison Wesley.
4. C. Ritehie: Operating Systems-Incorporating UNIX and Windows, BPB Publications.
5. M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley.

Practical Examination Scheme

Max. Marks – 30	Time Duration – 3 Hrs.
Practical (two)	20 Marks(10 marks each)
Viva	05 Marks
Sessional	05 Marks

M.Sc./M.A. Course (Fourth Semester)
PAPER-III (B)
Cosmology (II)

Max Marks – 80

Unit-I: Cosmology-physical universe, Mach's principle, Einstein modified field equations with cosmological term.

Unit-II: Static Cosmological models of Einstein and De-Sitter, their derivation, properties and comparison with the actual universe.

Unit-III: Hubble's law. Cosmological principles. Weyl's postulate. Derivation of Robertson-Walker metric. Hubble and deceleration parameters. Redshift. Redshift versus distance relation. Angular size versus redshift relation and source counts in Robertson-Walker space-time.

Unit-IV: Friedmann models. Fundamental equations of dynamical cosmology. Critical density. Closed and open Universes. Age of the Universe. Matter dominated era of the Universe.

Unit-V: Einstein-deSitter model. Particle and even horizons. Eddington-Lamaitre models with I-term. Perfect cosmological principle. Steady state cosmology.

REFERENCES:

1. J. V. Narlikar, General Relativity and Cosmologyi Ths Macmillan Company of India Urnited, 1978.
2. S. Weinberg, Gravitation and Cosmology: Principles and applications of the general theory of relativity, John Wiley & Sons, Inc. 1972.
3. J. V. Narlikar, Introduction to Cosmology, Cambridge University Press, 1993.
4. L. D. Landau and E.M. Lilshitz, The classical theory of Fields, Pergamon Press, 1980.

M.Sc./M.A. Course (Fourth Semester)

PAPER-III (C)

Fuzzy Set Theory & Its Applications (II)

Max Marks – 80

Unit-I Fuzzy Logic-An overview of classical logic, Multivalued logics, Fuzzy propositions. Fuzzy quantifiers. Linguistic variables and hedges. Inference from conditional fuzzy propositions, the compositional rule of inference.

Unit-II Approximate Reasoning-An overview of Fuzzy expert system. Fuzzy implications and their selection. Multiconditional approximate reasoning. The role of fuzzy relation equation.

Unit-III An introduction to Fuzzy Control-Fuzzy controllers. Fuzzy rule base. Fuzzy inference engine. Fuzzification.

Unit-IV Defuzzification and the various defuzzitication methods (the centre of area, the centre of maxima, and the mean of maxima methods).

Unit-V Decision Making in Fuzzy Environment-Individual decision making. Multiperson decision making. Multicriteria decision making. Multistage decision making. Fuzzy ranking methods. Fuzzy linear programming.

REFERENCES :

1. H. J. Zimmemann, Fuzzy set theory and its Applications, Allied Publishers Ltd. New Delhi, 1991.
2. G. J. Klir and B. Yuan- Fuzzy sets and fuzzy logic, Prentice-Hall ol India, New Delhi, 1995.

M.Sc./M.A. Course (Fourth Semester)
PAPER-III (D)
Mathematical Biology (II)

Max. Marks - 80

UNIT-I

Tumor Modelling: Phenomenological Models, Nutrients: the Diffusion-limited Stage, Moving Boundary Problems, Growth Promoters and Inhibitors, Vascularisation, Metastasis, Immune System Response.

UNIT-II

Growth and Control of Brain Tumours: Basic Mathematical Model of Glioma Growth and Invasion, Tumour Spread *In Vitro*: Parameter Estimation, Tumour Invasion in the Rat Brain, Tumour Invasion in the Human Brain, Modelling Tumour Resection in Homogeneous Tissue, Analytical Solution for Tumour Recurrence After Resection, Modelling Surgical Resection with Brain Tissue Heterogeneity, Modelling the Effect of Chemotherapy on Tumour Growth, Modelling Tumour Polyclonality and Cell Mutation.

UNIT-III

Dynamics of Infectious Diseases: Historical Aside on Epidemics, Simple Epidemic Models and Practical Applications, Modelling Venereal Diseases, Multi-Group Model for Gonorrhea and Its Control, Bovine Tuberculosis Infection in Badgers and Cattle, Modelling Control Strategies for Bovine Tuberculosis in Badgers and Cattle.

UNIT-IV

Modelling of Immunodeficiency Virus: AIDS: Modelling the Transmission Dynamics of the Human Immunodeficiency Virus (HIV), HIV: Modelling Combination Drug Therapy, Delay Model for HIV Infection with Drug Therapy, Modelling the Population Dynamics of Acquired Immunity to Parasite Infection, Age- Dependent Epidemic Model and Threshold Criterion, Simple Drug Use Epidemic Model and Threshold Analysis.

UNIT-V

Geographic Spread and Control of Epidemics: Simple Model for the Spatial Spread of an Epidemic, Spread of the Black Death in Europe, Brief History of Rabies, Spatial Spread of Rabies Among Foxes: Background and Simple Model, Three- Species (*SIR*)Model. Control Strategy Based on Wave Propagation into a Nonepidemic Region: Estimate of Width of a Rabies Barrier, Analytic Approximation for the Width of the Rabies, Effect of Fox Immunity on the Spatial Spread of Rabies.

Recommended Books

1. Jeffrey R. Chasnov, Mathematical Biology, Lecture Notes for MATH(365), The Hong Kong University of Science and Technology (2010)
2. Nicholas F. Britton, Essential Mathematical Biology, Springer-Verlag (2003)
3. J. D. Murray, Mathematical Biology I. An Introduction, Springer-Verlag (2002) 3rd Edition.
4. J. D. Murray, Mathematical Biology II. Spatial Models and Biomedical Application, Springer-Verlag (2003) 3rd Edition.

M.Sc./M.A. Course (Fourth Semester)
PAPER –IV (A)
Operations Research (II)

Max. Marks 80

Unit-I Dynamic Programming-Deterministic and Probabilistic Dynamic programming.

Unit-II Game Theory-Two-Person, Zero-Sum Games. Games with Mixed Strategies. Graphical . Solution. Solution by Linear Programming.

Unit-III Integer Programming-Branch and Bound Technique.

Unit-IV Applications to Industrial Problems-Optimal product mix and activity levels. Petroleumi, Refinery operations, Blending problems, Economic interpretation of dual linear programming. Problems, Input-output analysis. Leontief system. Indecomposable and Decomposable economies.

Unit-V Nonlinear Programming-One/and Multi-Variable Unconstrained Optimization., Kuhn-Tucker Conditions for Constrained Optimization. Quadratic Programming. Separable Programming. I Convex Programming. Non-convex Programming.

Books Recommended :

1. F. S. Hillier and G. J. Lieberman. Introduction to Operations ResBareft (Sixth Edition), McGraw Hill International Edition, Industrial Engineering Series, 1995. (This book comes with a CD containing tutorial software).
2. G. Hadley, Linear Programming, Narosa Publishing House, 1995.
3. G. Hadly, Nonlinear and Dynamic Programming, Addison-Wesley, Reading Mass.
4. H. A. Taha, Operations Research -An introduction, Macmillan Publishing Co., Inc., New Yark.
5. Kanti Swarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand & Sons, New Delhi
6. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network flows, John Wiley & Sons, New York, 1990.

References

1. S. S. Rao, Optimization Theory and Applications, Wiley Eastern Ltd., New Delhi.
2. Prem Kumar Gupta and D.S. Hira, Operations Research-An Introduction. S. Cliand & Company Ltd., New Delhi.
3. N. S. Kambo, Mathematical Programming Techniques, Affiliated East-West Press Pvt. Ltd., New Delhi, Madras
4. R. K. Rathy, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
5. A. D. Young, Boundary Layers, AIAA Education Series, Washington DC, 1989.
6. S. W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.
7. LINDO Systems Products (Visit websHe htlp://www.Hndo.com/productsf.html)
   (i) LINDO (the linear programming solver)
   (ii) LINDO Callable Library (the premier optimisation engine)
   (iii) LINGO (the linear, non-linear, and integer programming solver with mathematical modelling language)
   (i) What's Best ! (the spreadssheet add-in that solves linear, non- linear, and integer problems).

   All the above four products are bundled into one package to form the Solver Suite. For more details about any of the four products one has to click on its name.
   (i) Optimisation Modelling with LINDO (8" edition) by Linus Schrage.
   (ii) Optimisation Modelling with LINGO by Linus Schrage. More details available on the Related Book page York, 1979.

M.Sc./M.A. Course (Fourth Semester)
PAPER-IV (B)
Wavelets (II)

Max Marks – 80

Unit-I Characterizations in the theory of wavelets-The basic equations and some of its applications.

Unit-II Characaterizations of MRA wavelets, low-pass filters and scaling functions. Non- existence of smooth wavelets in $H^2(R)$.

Unit-III Frames - The reconstruction formula and the Batian-Low theorem for frames. Frames from translations and dilations. Smooth frames for $H^2(R)$.

Unit-IV Discrete transforms and algorithms-The discrete and the fast Fourier transforms. The discrete and the fast cosine transforms.

Unit-IV The discrete version of the local sine and cosine bases. Decomposition and reconstruction algorithms for wavelets.

REFERENCES:

1. Eugenic HernBndez and Guido Weiss, A First Course on Wavelets, CRC Press, New York, 1996.
2. C. K. Chui, An Introduction to Wavelets, Academic Press, 1992.
3. I. Daubechies, Ten Lectures on Wavelets, CBS-NSF Regional Conferences in Applied Mathematics, 61, SIAM, I 1992.
4. Y. Meyer,Wavelets, algorithms and applications (Tran. by R.D. Rayan, SIAM, 1993.
5. M. V. Wickerhauser, Adapted wavelet analysis from theory to software, Wellesley, MA, A.K. Peters, 1994.

M.Sc./M.A. Course (Fourth Semester)

PAPER –V (A)

Programming in C (with ANSI features)

(II) Theory and Practical

Max. Marks. 100

(Theory-70 +Practical-30)

Unit-I Storage Classes-Fixed vs. Automatic Duration. Scope. Global variables. The register Specifier. ANSI rules for the syntax and Semantics of the storage-class keywords.

Unit-II Pointers Pointer Arithmetic. Passing Pointers as Function Arguments. Accessing Array Elements through Pointers. Passing Arrays as Function Arguments. Sorting Algorithms. Strings. Multidimensional Arrays. Arrays of Pointers. Pointers to Pointers.

Unit-III Functions-Passing Arguments. Declarations and Calls. Pointers to Functions. Recursion. The main Function. Complex Declarations.The C Preprocessor-Macro Substitution. Conditional Compilation. Include Facility. Line Control.

Unit-IV Structures and Unions-Structures. Dynamic Memory Allocation. Linked Lists. Unions, enum Declarations.

Unit-V Input and Output-Streams, Buffering. The <Stdio.h> Header File. Error Handling. Opening and Closing a File. Reading and Writing Data. Selecting an I/O Method. Unbuffered I/O Random Access. The standard library for Input/Output.

Books Recommended:

1. Peter A. Darnell and Philip E. Margolis, C: A Software Engineering Approach, Narosa Publishing House (Springer International Student Edition) 1993.
2. Samuel P. Harkison and Gly L. Steele Jr., C : A Reference Manual, 2nd Edition, Prentice Hall, 1984.
3. Brian W. Kernighan & Dennis M. Ritchie, The C Programme Language, 2nd Edition (ANSI Features), Prentice Hall 1989.

Practical Examination Scheme

Max. Marks – 30	Time Duration – 3 Hrs.
Practical (two)	20 Marks(10 marks each)
Viva	05 Marks
Sessional	05 Marks

M.Sc./M.A. Course (Fourth Semester)
PAPER-V (B)
Graph theory-II

Max. Marks - 80

Unit-I: Ramsey Theory: Perpectness-preserving operations, Forbidden Subgraph orientations, Ramsey numbers and Ramsey graphs.

Unit-II: Groups: Permutation groups, The automorphism group, graphs with given group, symmetry concepts, pseudo-similarity and stability, spectral studies of the Automorphism group.

Unit-III: Polynomials and Graph Enumeration: The colour polynomials, The chromatic polynomial, The bivariate colouring polynomials.

Unit-IV: Graph Enumeration: Co-chromatic (co-dichromatic) graphs and chromatically unique graphs, Graph Enumeration.

Unit-V: Digraphs & Networks: Digraphs, Types of connectedness, Flows in Networks, Menger's and Konig's Theorem, Degree sequences.

REFERENCES:

1. K. R. Parthasarathy, Basic graph theory, Tata Mc graw Hill publishing company limited, 1994.
2. R. J. Wilson, Introduction to graph theory, Longman Harlow, 1985.
3. John Clark, Derek Allon Holton, A first look at graph Theory, World Scientific Singapore, 1991.
4. Frank Hararary, Graph Theory Narosa, New Delhi, 1995.
5. Ronald Gould and Benjamin Cummins, Graph Theory, California.
6. Narsingh Deo, Graph Theory with applications to Engineering and Computer Science, Prentice-Hall of India Private Limited, New Delhi, 2002.

M.Sc./M.A. Course (Fourth Semester)
PAPER-V (C)
Algebraic Number Theory (II)

Max Marks – 80

UNIT-I

Extensions: Decomposition and ramification, Unramified extensions, Tamely ramified extensions.

UNIT-II

The Different and Discriminant: Complementary modules, The different and ramification, The discriminant.

UNIT-III

Cyclotomic Fields): Roots of unity, Quadratic fields, Gauss sums, Relations in ideal classes, Fermat's last theorem.

UNIT-IV

The Structure of Units: Dirichlet's Unit Theorem, Units in Real Quadratic Fields, Pell's equation.

UNIT-V

Zeta Functions: The Riemann Zeta Function, Dedekind Zeta Function

References:

1. Serge Lange: Algebraic Number Theory, Springer-Verlag, 1986.
2. Jean-Pierre Serre: Local Fields, Springer-Verlag, 1979
3. M. Ram Murty, Jody Esmonde: Problems in Algebraic Number Theory (2nd ed.), Springer, 2005.
4. H. P. F. Swinnerton-Dyer: A Brief Guide to Algebraic Number Theory, Cambridge University Press, 2001
5. A. Frohlich , M.J. Taylor: Algebraic Number Theory, Cambridge University Press, 1991.
6. Ian Stewart, David Tall: Algebraic Number Theory and Fermat's Last Theorem (3rd ed.), A K Peters, Natick, Massachusetts, 2002.
7. Ethan D. Bolker: Elementary Number Theory, An Algebraic Approach, W. A. Benjamin, Inc., New York, 1970
8. Jurgen Neukirch: Algebraic Number Theory, Springer-Verlag, 1999
9. William Stein: Algebraic Number Theory, a Computational Approach, Cambridge University Press, 1991.

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.Sc. (Zoology) Semester Exam

UNDER

FACULTY OF SCIENCE

Session 2019-21

(Approved by Board of Studies)

Effective from June 2019

HEMCHAND YADAV UNIVERSITY DURG
CHHATTISGARH
SYLLABUS FOR 2019-21
M. Sc. ZOOLOGY

Semester	Paper	Title	External marks	Internal marks	Credit
First DEC, 2017	I	Biosystematics, Taxonomy and Biodiversity	**80**	**20**	4
	II	Structure and Function of Invertebrates	**80**	**20**	4
	III	Population Genetics and Evolution	**80**	**20**	4
	IV	Tools & Techniques in Biology	**80**	**20**	4
	LC-I	Lab Course I (Based on paper I & II)	**80**	**20**	2
	LC-II	Lab Course II (Based on paper III & IV)	**80**	**20**	2
Second MAY-JUNE, 2018	I	Molecular Cell Biology and Biotechnology	**80**	**20**	4
	II	General Physiology and Endocrinology	**80**	**20**	4
	III	Development Biology	**80**	**20**	4
	IV	Quantitative Biology and Computer Application	**80**	**20**	4
	LC-I	Lab Course I (Based on paper I & II)	**80**	**20**	2
	LC-II	Lab Course II (Based on paper III & IV)	**80**	**20**	2
Third DEC, 2018	I	Comparative Anatomy of Vertebrates	**80**	**20**	4
	II	Animal Behavior	**80**	**20**	4
	III	Environment Physiology and Population Ecology	**80**	**20**	4
	IV	Immunology and Parasitism	**80**	**20**	4
	LC-I	Lab Course I (Based on paper I & II)	**80**	**20**	2
	LC-II	Lab Course II (Based on paper III & IV)	**80**	**20**	2
	Compulsory				

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Fourth MAY-JUNE, 2019	I	Biochemistry	**80**	**20**	4
	II	Neurophysiology	**80**	**20**	4
Optional papers (Group I)*					
	I	Fish (ichthyology) structure and function	**80**	**20**	4
	II	Cell biology	**80**	**20**	4
	III	Entomology	**80**	**20**	4
	IV	Wild life conservation	**80**	**20**	4
	V	Biology of Vertebrate immune system	**80**	**20**	4
Optional paper (Group II)*					
	I	Pisciculture and economic importance of fishes (Ichthyology)	**80**	**20**	4
	II	Cellular organization and molecular organization	**80**	**20**	4
	III	Applied entomology	**80**	**20**	4
	IV	Environment and Biodiversity conservation	**80**	**20**	4
	V	Molecular endocrinology and reproductive technology	**80**	**20**	4
	LC-I	Lab Course I (Based on paper I & II)	**80**	**20**	2
	LC-II	Lab Course I (Based on paper III & IV)	**80**	**20**	2
Total			**1920**	**480**	**80**

* Student has choice to opt. for one paper each (special paper) from group I & group II.
* Each theory paper will have 5 questions of equal marks. First question will encompass all the four units without any internal choice, whereas rest questions will be unit wise with internal choice.

UGC guideline should be strictly followed for animal dissections. Animal dissections can be performed by using alternate methods like clay modeling.

**The respective teachers on each paper will ensure the internal evaluation by a class test and a seminar/ poster presentation of 10 marks each and submit the foil and counter foil to the HOD by the end the activity.

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M. Sc. ZOOLOGY FIRST SEMESTER
PAPER – I
BIOSYSTEMATICS, TAXONOMY AND BIODIVERSITY

(There will be 5 questions of equal marks. First question will encompass all the four units without any internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Definition and basic concepts of biosystematics and taxonomy.
  - Historical resume of systematics.
  - Importance and applications of biosystematics in biology
  - Trends in biosystematics concepts of different conventional and newer aspects
  - Chemotaxonomy
  - Cytotaxonomy
  - Molecular taxonomy

UNIT-II

- Dimensions of speciation and taxonomic characters
  - Mechanisms of speciation in panmictic and apomictic species
  - Species concepts and species category.
  - Theories of biological classification.
  - Taxonomic characters and different kinds.

UNIT-III

- Procedure keys in taxonomy.
  - Taxonomic procedures-taxonomic collections, preservation, curetting
  - Taxonomic keys-different kinds of taxonomic keys, their merits and demerits.
  - Process of typification and different Zoological types.
  - International code of Zoological Nomenclature (ICZN)
  -

UNIT-IV

- Biodiversity
  - Types of Biodiversity
  - Hot spots of Biodiversity
  - Threats to Biodiversity
  - Conservation of Biodiversity
- Evaluation of biodiversity indices
  - Shannon-Weiner index.

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **Biosystematics & Taxonomy**

  Dr. R. C. Tripathi, University Book House Jaipur

- **Theory & Practice of Animal Taxonomy**

  V.C. Kapoor, 5th Edition Oxford & IBH Publishing Co.

- **Principle of Animal Taxonomy**

  G.G. Simpson, Oxford & IBH Publishing Co.

- **Elements of axonomy**

  Earnst Mayer

- **Biodiversity**
- **E.O. Vilson,** Academic Press Washington
- **The Biology of Biodiversity M. Kato,** Springer
- **Molecular Markers - Natural History & Evolution J.C. Avise**

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M.Sc. ZOOLOGY FIRST SEMESTER

PAPER-II: STRUCTURE & FUNCTION OF INVERTEBRATES

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Organization of coelom
  - Acoelomates and Pseudocoelomates
  - Coelomates: Protostomia and Deuterostomia.
- Locomotion
  - Flagellar and cilliary movement in Protozoa.
  - Hydrostatic movement in Coelenterata, Annelida and Echinodermata.

UNIT-II

- Nutrition and Digestion
  - Patterns of feeding and digestion in Protozoa
  - Filter feeding in polychaeta.
- Respiration
  - Organs of respiration Gills, lungs and trachea.
  - Respiratory pigments.

UNIT-III

- Excretion
  - Organs of excretion.
  - Excretion and osmoregulation
- Nervous System
  - Primitive nervous system: Coelenterata and Echinodermata.
  - Advanced Nervous system: Arthropoda (Crustacea and insecta) and Mollusca (Cephalopoda)

UNIT-IV

- Invertebrate larvae
- Larval forms of free-living and parasitic invertebrates
- Minor Phyla
  - Organization and general characters of (Ctenophore, Rotifera, Ectoprocta, Endoprocta)

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SUGGESTED READING MATERIALS (ALL LATEST EDITION)

- **Invertebrate Structure and function:-**

  E.J.W. Barrigton English language Book society UK.

- **Invertebrate Zoology:**

  Robert Barnes IV Edition Holt Saunders International Edition japan.

- **The Cambrige Natural History Vol 1 - 9.**

  S F Harmer, A.E. Shipley.

  Todays & Tomorrows Book agency, New Delhi India.

- **A Text book of Zoology Invertebrate:**

  Parker Hasvell, Marshall & Williams.

  AITBS Publishing & Distributers, Delhi

- **The Invertebrates Vol. 1 - 9**

  Libbic Henrietta Hyman, McGraw Hill Book Company

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M. Sc. ZOOLOGY FIRST SEMESTER
PAPER-III: POPULATION GENETICS & EVOLUTION

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Concepts of evolution and theories of organic evolution: Lamarckism, Darwinism and Synthetic theory of evolution
- Evidences of evolution: anatomical, embryological, palaentological, physiological and Bio-chemical

Unit-II

- Hardy-Weinberg law of genetic equilibrium
- Detailed account of destabilizing forces.
  - Natural selection (i) Mutation
    (ii) Genetic drift
    (iii) Meiotic drive
- Phenotypic variation

UNIT-III

- Patterns and mechanisms of reproductive isolation
- Phylogenetic and biological concepts of species
- Gene Evolution, Evolution of gene families
- Factors affecting human disease

UNIT-IV

- Origin of higher categories
- Micro-and Macro-evolution
- Evolution of horse, elephant, camel, man

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **Gene & Evolution**

  Jha A.P. John Publication, New Delhi

- **Evolution & Genetics**

  Merrel D.J. Holt rinchert & Wiston INC.

- **The Genetics & Origin of Species**

  Dobzhansky, Columbia University Press.

- **Evolution**

  Dobzhansky, Ayala F.J., Stebbins G.L. & Valentine J.M. Surjeet Publication New Delhi.

- **Species Evolution - The Role of Chromosomal Change**

  King M. Cambridge University Press. Cambridge

- **A Primer of Population Genetics**

  Hartl D.L. Suinaer Associates INC, Massachusetts

- **Evolutionary Genetics**

  Smith J.M. Oxford University Press, New York

- **Evolutionary Biology**
- Futuyama D.J. Suinaer Associates INC publishers, Dunderland
- **Evolution**

  Strikberger M.W. Johns & Bartett Publishers, Boston London

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M. Sc. ZOOLOGY FIRST
SEMESTER PAPER-IV
TOOLS & TECHNIQUES IN BIOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Principles and application of
  - Ultracentrifugation
  - Electrophoresis
  - Chromatography (various types)
  - Lambert-Beers Law and colorimetry and spectrophotometry
  - Flow cytometry.

UNIT-II

- Principles and Application of
  - Light Microscopy and micrometry
  - Phase Contrast microscopy
  - Interference microscopy
  - Fluorescence microscopy
  - Transmission Electron microscopy.
  - Scanning Electron microscopy.

UNIT-III

- Assay
- Chemical assays
- Biological assays-in vivo and in vitro
- Principles of cytological and cytochemical techniques
  - Fixation: chemical basis of fixation by formaldehyde, gluteraldehyde, chromium salts, mercury salts, osmium salts, alcohol and acetone
  - Chemical basis of staining of carbohydrate, protein lipids and nucleic acids.

UNIT-IV

- Principle and techniques of
  - Nucleic acid hybridization and cot curve
  - Sequencing of proteins and nucleic acids
- Freeze techniques
- Media preparation and sterilization
- Inoculation and growth monitoring

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **Introduction to Instrumental Analysis**
- **Robert Braun,** McGraw Hill International Edition
- **A biologist guide to principles and techniques of practical biochemistry**
- **K Wilson and K. H. Goulding** ELBs Edition
- **Instrumentation**
- **Upadhyay and Nath,** Meerut Publications
- **Instrumentation and Techniques**
- **R.C. Bajpayee,** Himalayan Publications

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M. Sc. ZOOLOGY FIRST SEMESTER

LAB COUSE-I: (PRACTICAL BASED ON PAPER I & II)

- **Biosystematics and Taxonomy**
- Study of biodiversity among various invertebrates and vertebrates (Listing of all the animals found in and around your house and also try to find out their Zoological names).
- Collection of various insect species.
- Visits to a local animal park or zoo to identify and study the captive fauna and preparation of report.
- Study of adaptive characteristics of various invertebrates and vertebrates in different climate.
- Taxonomic key formation and conversion.
- Study of biodiversity in grassland and pond water by using Shannon -Weiner index
- Other exercise related to theory paper
- **Structure and function of invertebrates**
- Identification, classification and study of distinguishing features of important representatives from various groups (Protozoa to Hemichordata Ciliary Feeders)**.**
- Study of permanent prepared slides (from Protozoa to Hemichordata).
- Dissection by using alternate methods like clay modeling : Reproductive, Excretory, nervous and haemocoelomic systems of leech.
- Dissection by using alternate methods like clay modeling: Reproductive system of cockroach; general anatomy, nervous and reproductive systems of grasshopper; nervous system of crab; nervous and reproductive systems of scorpion.
- Dissection by using alternate methods like clay modeling: Nervous system of Mytilus, Sepia and Aplysia, general anatomy of Aplysia.
- Study of sections of the arm of a starfish; general anatomy of a Holothurian; Aristotle's lantern of a sea urchin complete as well as disarticulated parts of the Aristotle's lantern.
- Permanent preparations of different materials to be provided for study.
- Wonder invertebrates
- Other exercise related to theory paper.
- UGC guideline should be followed.

EXAMINATION SCHEME

Based on paper I	35 marks
Based on paper II	35 marks
Viva	10 marks
Sessional (Internal)	20 mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY FIRST SEMESTER
LAB COUSE-II: (PRACTICAL BASED ON PAPER III & IV)

Population genetics and evolution

- Problems on genetics (complete and incomplete linkage; dominance, sex-linked inheritance) Demonstration of Hardy-Weinberg law
- Preparation of human chromosomes map, demonstration of chromosomal deficiencies.
- Experiments based on population genetics, pedigree analysis.
- Study of evolution of horse by way of models.
- Study of evolution through homologous and analogous organs.
- Other exercises related to theory paper.

Tools and techniques in biology

- Parts study, principles and use of following instruments for different techniques:
- pH meter: Determination of pH of different soil and water samples.
- Spectrophotometer: Preparation of absorption spectrum.
- Chromatography: Paper and thin layer chromatography.
- Centrifuge: Extraction proteins and carbohydrates from tissues.
- Electrophoresis: Paper and gel electrophoresis.
- Microscope: Parts study and principles of various microscopes.
- Demonstration of cryostat.
- Other exercise related to theory paper.

EXAMINATION SCHEME

Based on paper III	35 marks
Based on paper IV	35 marks
Viva	10 marks
Sessional (Internal)	20 Mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY SECOND SEMESTER

PAPER – I: MOLECULAR CELL BIOLOGY AND BIOTECHNOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Biomembranes
  - Molecular composition and Organization of -
    - Plas one membrone
    - Mitochondina
    - E.R.
    - Cysosome
    - Golgibody
  - Tras port across The biomemberes – Mitochondia
    - Plasma membrane, E.R.
    - Ribosome and its Biogcuesis aolsi

UNIT-II

- DNA replication
  Protein Syn their- Central Dosma Regulation of translation
  Genetic Code.

UNIT-III

- Genome organization
  - Chromosomal organization: morphological and structural types. (Lamplrash, Polylene, Hetao chomation)
  - Non-coding DNA
- Molecular mapping of genome
  - Genetic and physical maps
  - Polymerase Chain Reaction (PCR) and blotting techniques
  - Molecular markers in genome analysis.

UNIT-IV

- Transgenic animals and knock-outs
  - Production and applications
  - Embryonic stem cells
- Application of genetic engineering
  - Medicine
  - Agriculture
  - Industry

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **MOLECULAR CELL BIOLOGY**
  Lodish, W.H. Freeman & Co. New York
- **Lehninger PRINCIPLES OF BIOCHEMISTRY,**
  Fourth Edition - David L [1]. Nelson, Michael M. Cox
- **MOLECULAR CELL BIOLOGY**
  Lodish M. Baltimore, Scientific American books
- **ESSENTIALS OF CELL & MOLECULAR BIOLOGY**
  Roberties & Roberties, Halt Saunders International Edition.
- **CELL & MOLECULAR CELL BIOLOGY**
  Gerald Karp, Willey & Sons Co.
- **MEDICAL CELL BIOLOGY**
  Flickinger E.J. Brown J.C. Halt Saunders International Edition.
- **CELL BIOLOGY**
  Powar C.B. Himalaya Publishing House

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M. Sc. ZOOLOGY SEMESTER - II
PAPER – II: GENERAL PHYSIOLOGY AND ENDOCRINOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Digestion and Metabolism
  - General organization of alimentary canal
  - Mechanism of digestion
  - Mechanism of absorption
- Gas Exchange and Acid-base Balance
  - Oxygen and Carbon dioxide transport in blood
  - Structure and Significance hemoglobin
  - Regulation of body pH
- Thermoregulation and Cold Tolerance
  - Heat balance and exchange
  - Endotherms Vs Ectotherms
  - Torpor, hibernation and aestivation

UNIT-II

- Muscle Function and Movement
  - Anatomy of muscle
  - Mechanism of muscle contraction
  - Regulation of muscle contraction
- Nervous System
  - Neurons and membrane excitation
  - Resting Membranc & Action Potential
  - Nave Impulse
  - Synapses and neurotransmitters
  - Synaptic transmission
- Sensory Transduction
  - Auditory receptors
  - Chemoreceptor: taste and smell
  - Vision and Photoreception – Photo Chemistry of vision

UNIT-III

- Endocrinology
  - Structure and functions of endocrine glands (Pituitary, pineal, pancreas, adrenal, thyroid etc.)
  - Some New Homeones Ghrelin, Leptin, Amylin, Renin, Anf.
  - Biosynthesis of hormones (thyroid and gonadal)
  - Hormones and Reproduction -Pregnancy, Parturition, Lactation
  - Hormonal Control - Estrous Cycle menstrual cycle Menarche Puberty Menopause

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UNIT-IV

- Mechanism of Hormone action
- Hormone receptors
- Hormonal recrulation of metabolism carbohydrate, Proteins and fats.
- Hormones & Homeostasis

SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- Comparative vertebrate Endocrinology – by **Gorbman & Bern**
- Medical Physiology by Guyton and Hall
- Physiology by **Antonio Lucanio**
- Human Physiology – by **Dr. C. C. Chatterjee**
- Comparative Endocrinology – by **Barrington**
- Applied Animal Endocrinology – by **Squires**
- **Endocrinology –** Basic & Clinical principles - by **Melmed & Cohn**
- **T.B. of Endocrinology by Griffin.**
- **Endocrinology by Hardly.**

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M. Sc. ZOOLOGY SEMESTER - II PAPER – III:
DEVELOPMENT BIOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Oogenesis
- Differentiation and growth of oocytes.
- Organization of egg cytoplasm and egg cortex.
- Vitellogenesis
- Spermatogenesis
- Differentiation and ultra-structure of sperm
- Spermatocytogenesis Spermiation

UNIT-II

- Fertilization
  - Biological role of fertilization.
  - Basic requirements of fertilization.
  - Activation of egg metabolism
  - Capacitation
  - Biochemistry of fertilization
- Cleavage
  - Characteristics and mechanisms of cleavages, Egg types

UNIT-III

- Formative movements
  - Fate maps - Organogenesis
  - Utility and comparative topographical relationship of the Presumptive areas in early embryos of
  - Amphioxus
  - Fishes
  - Amphibian
  - Birds
- Differentiation

UNIT-IV

- Cell and tissue interactions in development
  - Primary embryonic induction
  - Competence
  - Concept of organizer
- Metamorphosis
- Teratology

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SUGGESTED READINGS MATERIALS

- **Animal Gametes** –

  Vishmanath, Asia Publishing House

- **Foundation Of Embrology** –

  Bradley M.Patten, McGrow Publication

- **Fertilization In Animals** –

  Brain Dale, Arlond Heiniman, Gulab Vazerani Publication

- **Development Biology** -

  N.J. Berril, Tata McGraw Hill Publication N. Delhi

- **Embryology Of Vertebrates** -

  Nelson

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M. Sc. ZOOLOGY SEMESTER - II
PAPER – IV: QUANTITATIVE BIOLOGY AND COMPUTER APPLICATION

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Introduction to digital computer and application
  - Basic knowledge of hardware and software
  - CPU (Central Processing Unit)
  - Input and Output devices
  - Auxiliary storage system
  - Operating system and Binary number system

UNIT-II

- Computer application
  - Introduction to MS office
    - Word
    - Excel
    - Power point
- Computer application in biostatistics
- Simple computation and elementary knowledge of flow chart

UNIT-III

- Types of biological data
- Representation of data
- Sample and sampling
- Measures of central tendency
- Measures of dispersion
- Hypothesis testing: Null and alternate hypothesis

UNIT-IV

- Tests of significance
  - Chi-square test
  - Student's t-test
- Analysis of Variance
- Simple linear regression
- Correlation
- Probability distribution: normal and binomial

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SUGGESTED READING MATERIALS

Bataschelet. E. Introduction to mathematics for site scientist springer-verlag, berling

Lenderen D. Modelling in behavioral ecology. Chapman & Hall London U.K.

Snedecor, G.W. and W.G. cochran, statical methods, Affilited East,

West Press New Delhi (Indian ed.)

Muray , J.D. Methamatical Biology, Springer Verlag Berlin

Pelon, E.C. The interpretation of ecological data :

A promer on classification and ordivation.

A. lewis . Biostatics

B.K. Mahajan Methods in Biostatics

J.D. Murrey Mathematical Biology

Georgs & Wilians Startical method

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M. Sc. ZOOLOGY SEMESTER – II
LAB COURSE – I: (PRACTICAL BASED ON PAPER I & II)

- **Molecular biology and Biotechnology**

- Isolation of DNA/RNA
- Study of mitochondria from buccal epithelium by staining with supravital stains.
- Culture of amoeba, paramecium, euglena.
- Study of cell division mitosis/meiosis by squash and smear preparation of root tip and cockroach/grasshopper testis.
- Study of giant chromosome in the salivary gland of Chironomous larvae or Drosophila.
- Study of Barr body and human chromosome.
- Culture and study of drosophila.
- Preparation of culture media and culture of bacteria.
- Other exercise related to theory paper.

General physiology and endocrinology

- Estimation of RBC, hemoglobin, hematocrit/PVC, blood group and Rh factor blood clotting time.
- Determine the blood pressure of man.
- Determination of urea, glucose and ketone bodies in urine.
- Demonstration of osmosis.
- Dissection by using alternate methods like clay modeling and exposure of major endocrine glands in an experimental animals.
- Study of histology of endocrine glands in different animal types through permanent slides and microtomy.
- Other exercise related to theory paper.

EXAMINATION SCHEME

Exercise based on paper I	35 marks
Exercise based on paper II	35 marks
Viva	10 marks

Sessional (Internal)	20 Mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY SEMESTER – II
LAB COURSE-II: (PRACTICAL BASED ON PAPER III & IV)

Development biology

- Study of slides of development of frog.
- Study of development of Hen's egg, by cover glass window method, staining and mounting of blastodisc.
- Study of caudal regeneration in Teleost (Meal time effect).
- Study of embryological slides: spermatogenesis, oogenesis, histology of gonads.
- Study of effect of NaF/urea on growth of fish fingerlings.
- Study of effect of thyroid hormone on metamorphosis of tadpole
- Other exercises related to theory paper

Quantitative biology and computer application

- Preparation of frequency tables and graphs.
- Calculation of standard deviation, variance and standard error of mean.
- Calculation of probability and significance between means using t-test, Chi-square test, ANOVA
- Calculation of correlation, regression and probability distribution.
- Computer software use for computational tasks, data presentation, design task and communication
- Other exercises related to theory paper.

EXAMINATION SCHEME

Exercise based on paper III	35 mark
Exercise based on paper IV	35 mark
Viva	10 mark
Sessional (Internal)	20 Mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY SEMESTER - III
PAPER-I: COMPARATIVE ANATOMY OF VERTEBRATES

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise) with internal choice.

UNIT-I

- Origin of Chordates
- Amphibians, Reptiles, Birds and Mammals.
- Classificationof Vertebrates and specialty of respective classes
- Amphibians, Gymnophiona Neoteny, Parental case
- Reptiles – Extinct reptiles
- Birds – Palate in Birds
- Mammals. – New world and old world Mankeys

UNIT-II

- Vertebrate integument and its derivatives.
- General structure and functions of Integument.
- Structure and functions of glands, scales, horns, claws, nails, hoof, feather and hair.
- Skeletal system in vertebrates.
- Comparative account of (i) Jaw suspensorium, (ii) Limbs and Girdles.

UNIT-III

- Respiration in Vertebrates.
- Comparative account of respiratory organs (structure and functions).
- Circulation inVertebrates.
- Structure and function of blood.
- Evolution of heart.
- Evolution of aortic arches.

UNIT-IV

- Nervous System – Central, Peripheral and Autonomic.
- Sense organs.
- Comparative account of Sensory Receptors.
- Evolution of Urinogenital system in vertebrates.

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **Vertebrate life** :– William N. Ferland, F. Harvey pough, Tom J Gode, John B. Heiser
- Collier MacNillem International edition
- **Chordate morphology** :–Malcom Jollie
- Reinhold Publishing Corporation NewYork
- **Chordate –Structure & Function** :- Arnold G. Khage, B.E. Fry Johanson
- Mc Millan Publishing Co. INC. New York
- **Comparative Animal Physiology** :- Orosser
- Satish Book Enterprises, Agra
- **The Vertebrate Body** :- Alfred Sherwood Romer
- Vakils, Feffer & Simons Publications Ltd.

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M. Sc. ZOOLOGY SEMESTER – III PAPER-II:
ANIMAL BEHAVIOUR

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise) with internal choice.

UNIT- I

- Historical perspectives- Ethology
- Behavioural patterns
- Innate behaviour
- Biological rhythms
  - Types of biological rhythm
  - Biological clock

UNIT- II

- Communications
  - Auditory
  - Visual
  - Chemical
- Learning and Memory
  - Conditioning
  - Habituation
- Reasoning
- Reproductive behaviour.

UNIT-III

- Orientation
  - Echolocation in bats
  - Bird migration and navigation.
  - Fish migration.
  - Neural and hormonal control of behaviour

UNIT-IV

- Hormonal effect on behavioural patterns.
  - Social behaviour
  - Social organization in insects and primates
  - Schooling in fishes and Flocking in birds
  - Homing, territoriality, dispersal
  - Altruism
  - Host–parasite relation

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

- **ANIMAL BEHAVIOR – Mc Farland** (English Language Book Society)
- **ANIMAL BEHAVIOR** – **Arora M.P.** (Himalaya Publishing House, Mumbai)
- **ANIMAL BEHAVIOR - Reena Mathur** (Rastogi Publications, Meerut)

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M. Sc. ZOOLOGY SEMESTER – III
PAPER – III: ENVIRONMENT PHYSIOLOGY AND POPULATION ECOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT – I

Population dynamics:

- Demography, life table, reproductive rates, reproductive values
- Population growth, exponential, non overlapping
- Stochastic and time lag models of population growth
- Population density
- Population evolution
- Community dynamics: Characteristics, development and classification

UNIT-II

- Adaptations
  - Levels of adaptation.
  - Mechanisms of adaptation.
- Adaptations to different environments.
  - Marine, shores and estuaries.
  - Freshwater.
- Terrestrial Life.

UNIT-III

- Stress Physiology
  - Basic concepts of environmental stress and strain, Concept of elastic and plastic strain.
    - Stress avoidance, stress tolerance and stress resistance.
    - Acclimatization, acclimation and adaptation.
    - Endothermic and physiological mechanism of regulation of body temperature.

UNIT -IV

- Stress physiology in different conditions
  - Osmoregulation in aqueous and terrestrial habitats.
  - Physiological response to oxygen deficient stress.
  - Physiological response to body exercise.
  - Effect of meditation and yoga

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SUGGESTED READING MATERIALS - (ALL LATEST EDITION)

ECOLOGY with special reference to animal & man

S. Charles, Kendeigh Prentice hall of India Pvt. Ltd. New Delhi

- **ELEMENTS OF TROPICAL ECOLOGY**

- **Yanney Ewusie** (English language Book Society, Heine mann educational book publication)

- **FUNDAMENTALS OF ECOLOGY**

- **Odum P.**

- **ANIMAL PHYSIOLOGY, MECHANISM AND ADAPTATION -**

Eckert, R., W, H, Freeman and Co.

- **BIOCHEMICAL ADAPTATION -**

Hochachka, P.W, and Somero S.N, Princeton, New Jersey

- **ANIMAL PHYSIOLOGY: ADAPTATION AND ENVIRONMENT.-**

Schiemidt Nielsen, Cambridge

- **GENERAL & COMPARATIVE ANIMAL PHYSIOLOGY**

Hoar W.S. Princeton Hall of India

- **ENVIRONMENTALPHYSIOLOGY**

Willmer, P.G. Stone & Johansan I, Blackwell Science Oxford

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M. Sc. ZOOLOGY SEMESTER – III PAPER – IV: IMMUNOLOGY AND PARASITISM

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise with internal choice).

UNIT-I

- Cells of immune system
- B-Lymphocytes, T-lymphocytes (N K Cells, Helpa Cells, Killer Cells)
- Mononuclear cells
- Granulocytic cells (Neutrophils, Eosinophils and Basophils)
- Mast cells
- Dendritic cells
- Organs of immune system
- Primary lymphoid organs (Thymus, bone marrow)
- Secondary lymphoid organs (Lymph nodes, spleen, mucosal associated lymphoid tissue, cutaneous associated lymphoid tissue)

UNIT-II

- Immunoglobulin structure and function
- Molecular structure of Ig, Light chain and Heavy chain
- Immunoglobulin classes
- lgG
- lgM
- IgE
- lgD

Monoclonal antibodies

UNIT-III

- Antigens Immunogenicity
- Contribution of the immunogens.
- Contribution of Biological system.
- Antigen - Antibody Interaction
- Antibody affinity and activity
- Cross reactivity
- Agglutination reactions
- Precipitation Reaction
- Vaccine
- Active and passive immunization
- Whole organism vaccine
- Recombinant vector vaccines
- DNA vaccines

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UNIT-IV

- Immune system in Health disease
- Immune response to infectious disease
- Immune response in cancer
  - Pathophysiology of parasitic infection
  - Viral infections
  - Bacterial infection
  - Helminths infection
- AIDS

SUGGESTED READING MATERIALS

- **Immunology**
- **Kuby,** W.H. Froeman USA
- **Fundamental of Immunology**
- **W. Paul,**
- **Essential Immunology**
- **I.M. Roitt,** ELBs Edition
- **Immunology**
- **Richard M. Hyde, Robert A. Patnode,** A Wiley Medical Publications
- **Reproductive Physiology**
- **Gayton,**

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M. Sc. ZOOLOGY SEMESTER – III
LAB COURSE-I: (PRACTICAL BASED ON PAPER I & II)

- **Comparative anatomy of Vertebrates**
- Identification, classification and study of distinguishing features of important representatives, museum specimens and slides (Protochordates and Chordates)
- Comparative studies of integumentary, skeleton and reproductive system of major vertebrate classes.
- Dissections by using alternate methods like clay modeling: fowl/snake cranial nerves
- Wonder vertebrates
- Other exercise related to theory paper.

Animal Behavior

- To study the phototactic response in earthworm or grain/pulse pest.
- To study the geotaxis behavior of earthworm.
- To study the food preference and cleaning behavior of housefly.
- To study the food preference in tribolium or grain/pulse pests.
- To study the web construction and habituation in spider.
- Estimation of body temperature and pulse rate on daily time scale.
- Estimate the time perception among various individuals at two different time points on daily time scale.
- Determination of effect of time on schooling behavior in fish.
- Toxicological response of fish opercular and surfacing activity.

EXAMINATION SCHEME

Based on paper I	35 mark
Based on paper II	35 mark
Viva	10 mark
Sessional (Internal)	20 Mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY SEMESTER – III
LAB COURSE-II: (PRACTICAL BASED ON PAPER III & IV)

Immunology and Parasitism

- Dissection of primary and secondary immune organs from fish/fowl- Preparation and study of cell suspension from spleen (spleenocytes) of fish / fowl.
- Total and differential counting of leucocytes.
- Protein estimation by Lowry's method in normal and infected blood sample.
- Determination of Blood group.
- Study of permanent slides (for spotting); thymus, lymph nodes, spleen, bone marrow, types of cells squamous, cuboidal, columnar, epithelial cells, blood cells, nerve cells, muscles cells, connective tissue of various types, adipose tissue, mitotic and meiotic chromosomes and their different phases cancer cells of various types etc.
- Study of parasites in fish
- Study of various parasites through slides and specimen.
- Other exercises related to theory paper.
- **Environmental Biology, Population ecology**
- Study of biotic community in a pond/grassland ecosystem.
- Study of population growth rate (curve) in protozoan culture.
- Population dynamics of *Tribolium* sp.
- Study of biogeochemical cycles by way of models.
- Visit to some natural habitats and man made habitats to study the human impact on environment.
- Water analysis for fresh and waste water (Dissolve oxygen and chloride).
- Other exercises related to theory paper.

EXAMINATION SCHEME

Based on paper III	35 mark
Based on paper IV	35 mark
Viva	10 mark
Sessional (Internal)	20 Mark
Total	**80+20 (100)**

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M. Sc. ZOOLOGY SEMESTER – IV

PAPER– I (Compulsory)

BIOCHEMISTRY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise) with internal choice.

UNIT-I

- Properties of Proteins
  - Structure and properties of amino acids.
  - Classification of proteins.
  - Structure of proteins.
  - Biological Functions of Proteins.
  - Protein Metabolism.

UNIT-II

- Carbohydrates
  - Classification of carbohydrates.
  - Structure and Functions of Carbohydrates.
  - Carbohydrate metabolism.
- Lipid
  - Lipid structure and functions
  - Lipid metabolism.

UNIT-III

- Vitamins
  - Water and Fat soluble vitamins,
  - Chemistry, occurrence and physiological role.
- Enzymes
  - Classification and nomenclature.
  - Mechanism of action
  - Regulation of enzyme activity and functions of Co-enzymes.

UNIT-IV

- Nucleic acid
  - Chemistry of DNA.
  - Chemistry of RNA.
  - Biological importance of nucleic acids.
  - Nucleoproteins.
  - Metabolism of nucleic acids.

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Suggested Reading

Lehninger Principles of Biochemistry, Fourth Edition

David L. Nelson, Michael M. Cox

Publisher: W. H. Freeman

- **Biochemistry**

  Donald Voet, Hardcover: 1616 pages,

  Publisher: Wiley; 3 edition

- **Principles of Biochemistry With a Human Focus**

  Reginald H. Garrett, Charles M.

  Grisham Publisher: Brooks Cole

- **The Molecular Basis of Cell Cycle and Growth Control**

  Gary S. Stein (Editor), Renato Baserga, Antonio Giordano, David T.

  Denhardt, Publisher: Wiley-Liss

- **Experiments in Biochemistry: A Hands-On Approach**

  Shawn O. Farrell, Ryan T. Ranallo,

  Publisher: Brooks Cole

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M. Sc. ZOOLOGY SEMESTER – IV
PAPER II (Compulsory)
NEUROPHYSIOLOGY

(There will be 5 questions of equal marks. First question will be based on complete syllabus with no internal choice, whereas rest questions will be unit wise) with internal choice.

UNIT - I

- Physiological role of neurosecretory cells
- Histological structure of neurons and neuroglial cells
- Physiological properties of neural fibres
- Synapsis and synaptical transmission
- Myoneural junction and neuromuscular transmission
- Degeneration and regeneration of nerve fibre

UNIT - II

- Nerve fibre, peripheral nerves, receptors and effector endings, dermatomes and muscle activity
- The spinal cord and the ascending and descending tracts
- The cranial and spinal nerves

UNIT - III

- The fore brain, brain stem, the cerebellum
- The meninges and cerebrospinal fluid
- Peripheral nervous system

UNIT - IV

- Autonomic nervous system; sympathetic and para-sympathetic nervous system with special comparison to hormonal mechanism of transmission through autonomic nervous system
- Reflex action; verities, characteristics, unconditional reflex, electrophysiology of spinal reflexes
- Sensation
- Electro encephalography and its physiological basis.

Suggested Reading

- The Brain: Our Nervous System by Seymour Simon
- Mass Action in the Nervous System by Walter J. Freeman
- Human Anatomy and Physiology with Interactive Physiology 10-System Suite, 8th Edition by Elaine N. Marieb and Katja N. Hoehn (Jan 10, 2010)
- Neuroanantomy by H.G.Snell
- Clinical Neurophysiology-Guide for Authors - Elsevier
- Foundations of Cellular Neurophysiology (Bradford Books): Daniel Johnston, Optional papers

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M.Sc. ZOOLOGY SEMESTER – IV

- The following optional papers are being suggested as below
- OPTIONAL (SPECIAL PAPER) GROUP 1
- Fish (ichthyology) structure and function
- Or
- Cell Biology Or
- Entomology Or
- Wild life conservation Or
- Biology of vertebrates immune system
  OPTIONAL (SPECIAL PAPER) GROUP 2
- Pisci culture and economic importance of fishes (Icthyology) Or
- Cellular organization and molecular organization Or
- Applied entomology Or
- Environment and Biodiversity conservation Or
- Molecular endocrinology and reproductive technology
- ** Student has choice to opt for one paper each (special paper) from group 1 and group 2

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M. Sc Zoology Semester-IV

Paper- III A (optional paper)
Icthyology (Fish) Structure and Function

Unit-1

- Origin and evolution of fishes
- Classification of fishes as proposed by Berg
- Fish integument
- Locomotion
- Alimentary canal and digestion

Unit-2

- Accessary respiratory organs
- Air bladder and its functions
- Weberian ossicles their homologies and functions
- Excretion and osmoregulation
- Acoustico-lateral line system

Unit-3

- Luminous organs
- Colouration in fishes
- Sound producing organs
- Deep sea adaptions
- Hill stream adaptions

Unit-4

- migration in fishes
- Sexual cycle and fecundity
- parental care in fishes
- Early development and hatching
- Poisonous and venomous fishes.

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M.Sc Zoology Semester-IV

Paper- III B (Optional) Cell Biology

Unit-1

- Molecular organization of eukaryotic chromosomes : structure of nucleosome particles and higher order compaction of mitotic chromosomes, chromatin remodeling
- specialized chromosomes: structural organization and functional significance of polytene chromosomes
- DNA methylation and DNA Aase-1 Hypersensitivity in relation to gene activity and chromatin organization.
- specialized chromosomes II : structural organization and functional significance of lampbrush chromosome.
- Organisation and significance of heterochromatin.

Unit-2

- Structural organization of Eukaryotic genes, interrupted genes and overlapping genes and their evolution
- Gene families: organization, evolution and significance
- Transposable genetic elements of prokaryotes and eukaryotes Gene imitation and molecular mechanism of occurrence of mutation repair mechanism
- Organisation of eukaryotic transcriptional machinery promoter enhancers transcription factors polymerase activators and repressors.
- DNA binding domains of transcription apparatus zinc finger steroid receptors hemeo domains HILIX-loop, Helix and Leucine Zipper.

Unit-3

- Eukaryotic transcription of Eukaryotic transcriptional control.
- Environmental modulation of gene activity (stress response) stress genes and stress proteins
- Molecular basis of thalasemias muscular dystrophy cystic fibrosis
- DNA rearrangement
- Amplification during development with special response to
- Ciliates
- Choriongenc
- 5 Ssribosomal RNA

Unit-4

- Drosophila development
- Cleavage
- Grastrulation
- Origin of Anterior –Posterior (Maternal effect genes and segmentation genes
- Drosophila development II origin of dordal ventral polarity
- Basic idea of homoetic selector genes and homeotic mutation
- Basic idea of organization of homeoboxes
- Evolutionary significance of homeoboxes

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Suggested Reading Materials:

- Robertis, De and Robertis Cell and molecular biology Lea and Febiger.
- Watson Hopkis Roberts Steitz Weiner, Molecular Biology of the Gene the Benjamin, Cummings Publishin Company inc.
- Bruce A; berts Bray ewis Raff Roberts Watson Molecular Biology of the Cell,Garland Publishing inc.
- Watson Gilman Witkowski Zoller Recombinant DNA Scientific American Books.
- Karp Gerald Cell Biology.
- Lewin B., Genes VII.
- King Cell Biology.
- Kaniel L. Hartl, Elizabeth W. Jones. Genetics Principals and Analysis, Jones and Bartlett Publishers.
- Kuby, Immunology, W.H. Freeman and Company.
- Roitt Male Snustad Immunology.

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M.Sc. Zoology Semester-IV
Paper- III
C (Optional) Entomology

Unit-1

- Insect head types and modification as per their habit and habitat
- Modification of mouth parts and feeding behaviour
- Structure types and function of antennae
- Hypothetical wing venation
- Structure of cuticle and pigment

Unit-2

- Sclerotisation and tanning of the cuticle
- Structure of alimentary canal and Physiology of digestion
- Malphighian tubules – anatomical organization , Transport mechanism
- Structure of circulatory system
- Cellular elements in the haemolymph

Unit-3

- Structure of compound eye and Physiology of Vision
- Sound Production in insect
- Structure and function of endocrine glands
- Pheromones

Unit-4

- Embryonic membranous up to the formation of blastoderm
- Metamorphosis
- Insecticide effects on CNS
- Important pest of Soybean Modern concept of pest management

Suggested Reading Materials:

- The Insect: Structure and function by R.F. Chapman
- Comparative Insect physiology, Biochemistry and Pharmacology .Vol :1-13. Edited by G.A. Kerkut and L.I. Gilbert.
- Entomophagous Insect by Clausen
- Entomology bu Gilbert
- Principles of Insect Physiology by Wigglesworth.
- Fundamentals of Entomology by Elzinga
- Hand book of economic Entomology for South India by Ayyar.
- Insect cytogenetics by R.E.F. Symposium.
- Insects and plants by Sting, Lawton and southwood.
- Insect and hygiene by Busvine.
- Insect Physiology by Wigglesworth.
- Insect morphology by Mat Calf and Flint
- Applied Agricultural Entomology by Dr. Lalit Kumar Jha

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M.Sc. Zoology Semester-IV
Paper- III D (Optional) Wild Life Conservation

Unit-1

- Wild life -
- Values of wild life - positive and negative.
- Our conservation ethics.
- Importance of conservation.
- Causes of depletion.
- World conservation strategies.
- Habitat analysis, Evaluation and management of wild life.
- Physical parameters - Topography, Geology, Soil and water.
- Biological Parameters - food, cover, forage, browse and cover estimation.
- Standard evaluation procedures - remote sensing and GIS.
- Management of habitats -
- Setting back succession.
- Grazing logging.
- Mechanical treatment.
- Advancing the successional process.
- Cover construction.
- Preservation of general genetic diversity.

Unit-2

- Population estimation.
- Population density, Natality, Birth rate, Mortality, fertility schedules and sex ratio
- computation.
- Faecal analysis of ungulates and carnivores - Faecal samples, slide preparation, Hair identification, Pug marks and census method.
- National Organization.
- Indian board of wild life.
- Bombay Natural History Society.
- Voluntary organization involed in wild life conservation.
- Wild life Legislation - Wild Protection act - 1972, its amendments and implementation.
- Management planning of wild life in protected areas.
- Estimation of carrying capacity

Unit-3

- Eco tourism / wild life tourism in forests.
- Concept of climax persistence.
- Ecology of perturbence.
- Management of excess population & translocation.
- Bio-telemetry.
- Care of injured and diseased animal.

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Unit-4

- Quarantine.
- Common diseases of wild animal.
- Protected areas National parks & sanctuaries, Community reserve.
- Important features of protected areas in India.
- Tiger conservation - Tiger reserve in M.P, in India.
- Management challenges in Tiger reserve.

Suggested Reading Materials:

- Gopal Rajesh : Fundamentals of wild life management
- Agrawal K.C : Wild life India
- Dwivedi A.P (2008) : Management wild life in India
- Asthana D.K : Envionment problem and solution
- Rodgers N.A & Panwar H.S : Planning of wild life / Protected area Network in India vol. the report, wild life Institute of India Dehradun.
- Odum E.P : Fundamentals of Ecology
- Saharia V.B : Wild life in India
- Tiwari S.K : Wild life in Central India
- E.P Gee : Wild life of India
- Negi S.S : Wild life conservation (Natraj Publishers)

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M. Sc Zoology Semester-IV
Paper- III E (Optional)
Biology of vertebrate immune system

Unit-1

- Tissues of Immune system- Primary lymphoid organs, structure and functions
- (Thymus and Bursa of Fabricius)
- tissues of Immune system- Secondary lymphoid organs, structure and functions
- (Spleen, lymphnode and Payers patches)
- Antigen processing
- Antigen presentation

Unit-2

- **T-cell** lineage and receptors
- T-cell activation
- B-cell lineage and receptors
- B-cell activation
- Immunoglobulin structure, Biological and physical properties of immunoglobulin
- Gene model for Immunoglobulin gene structure

Unit-3

- Generation of antibody diversity (Light and heavy chain)
- Immunization
- Immediate type of hypersensitivity reaction of Anaphylectic type-1.
- Antibody dependent cytotoxic type II reaction.
- . Complex mediated type III reaction

Unit-4

- Delayed type cell mediated hypersensitivity type IV reaction.
- Enzyme linked immunosorbent assay (ELISA) technique and its applications.
- Immunofluorescence technique (Direct & Indirect and Sandwich antibody labelling techniques.
- Immunodiffusion techniques (Mancini and oucheterlony immunodiffusion techniques) Monoclonal antibody technology (Hybridoma technology)

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M.Sc Zoology Semester-IV

Paper- IV A (Optional)

Pisci Culture and Economic Importance of Fishes (Icthyology)

Unit-1

- Collection of fish seed from natural resources and transportation of fish seed.
- Breeding in fish, Bundh breeding and Induced breeding.
- Types of ponds required for fresh water fish culture farms.
- Management of fish farm.
- Physiochemical factors of freshwater for fish farming.

Unit-2

- Composite fish culture
- Prawn culture and pearl industries in India.
- Fisheries resources of C.G.
- Riverine fishries.

Unit-3

- Costal fishries in India
- Offshore and deep sea fishery's in India
- Role of fishries in rural development
- Sewage fed fishries

Unit-4

- Methods of fish preservation
- Marketing of fish in India.
- Economic importance and by product of fishes
- Fish disease.

Suggested Reading Materials: Paper III A & IV A

- JR. Norman - The History of fishes.
- Nagaraja Rao - An introduction to fisheries.
- Lagler Ichthyology.
- Herclen Jones Fish migration.
- Marshal The life of fishes.
- Thomas - Diseases of fish.
- Greenwood - Inter relationship of fishes.
- Gopalji, Srivastava - Freshwater fishes of U.P. and Bihar.
- Brown -Physiology of fishes Vol. I & II.
- Hoar and Randall -Fish physiology of fishes Vol. 1 & IX.
- Gunther Sterba C.N.H.-Freshwater fishes of the world
- W. Lanharn -The Fishes.
- G.V. Nikolsky -The ecology of Fishes,
- Borgstram -Fish as food Vol. I & II.
- Nilsson -Fish physiology -Recent Advances.
- P.B. Myle and J.J. Cech Fishes An Introduction to Ichthyology.
- Carl E. Bond -Biology of fishes.
- M. Jobling -Environmental Biology of fishes.
- Santosh Kumar & Manju Ternbhre -Fish and Fisheries.
- S.K. Gupta-Fish and Fisheries
- K.P. Vishwas -Fish and Fishries.
- Jhingaran -Fish and Fishries.

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M.Sc. Zoology Semester-IV
Paper- IV B (Optional)
Cellular Organization and Molecular Organization.

Unit-1

- General organization and characterizes of viruses (Examples SV 40 and HIV).
- Yeast : Structure, reproduction and chromosome organization: Basic ides of its applications as vectors for gene cloning.
- Molecular organization of reoiratory chain assemblies, ATP / ADP
- Translocase and F0F1 ATpase.
- Cell cycle: Cell cycle control in mammalian cells and xenopus.
- Cytochemistry of Golgin complex and its role in cell seretion.,

Unit-2

- Peroxisomes and training of paroxysmal proteins.
- Nucleolus: Structure and Biogenesis and functions of lysosomes.
- Intracellular digestion : Ultra structure and function of lysosomes.
- Synthesis and targeting of mitochondrial proteins.
- Secretary pathways and translocation of secretary proteins across the EPR membrane.

Unit-3

- Genome complexity: C- value [paradox and cot value].
- DNA sequences of different complexity.
- Difference between normal cells and cancer cells.
- Biochemical changes.
- Cytoskeleton changes.
- Cell surface changes.
- Genetic basis of human cancer

Unit-4

- Chromosomal abnormalities in human cancer.
- General idea of onchogens and proto onchogens.
- Onchogence and cancer.
- Transforming Agents.
- Tumor Supressor geanes.
- Receptor – Ligand interaction and signal transduction. Cross – talk among various signaling pathways.

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Suggested Reading Materials:

- DeRobertis and De Robertis Cell and Molecular Biology. Lea and Febiger.
- We Watson Hopking reberts steits, Weiner molecular biology of the gene, the Benjamin / Cummings Publishin Company Inc.
- Bruce alberts, Bray, Lewis, Raff, Roberts, Watson molecular Biology of the cell garland publishing inc.
- P.K. Gupta, Molecular Cell Biology Rastogi Publication.
- Watson Gilman Witkowski, Zoller Recomdinant D.N.A. scientific American Books.
- Gerald Karp. Cell Biology.
- Lewin B. Genes VII.
- King Cell Biology.
- Baniel L. HArtl Elizabeth W. Jones, Genetics Principles and analysis. Jones and Bartlett Publisher.
- Lodish, Berk Zipursky, Matsudaira Baltimore Dernell Molecular Cell Biology W.H.Freeman and company.
- J. Travers Immunology current Biology limited.
- Kubey Immunology W.H. Freeman and Company.
- Riott, Male snustad Principles of genetics john weley and sons Inc.

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M. Sc Zoology Semester-IV
Paper- IV C (Optional)
Applied Entomology

Unit-1

Classification according to imms

- Classification of apterygota upto families.
- Classification of following insect orders

(a) orthoptera (b) hemiptera (c) diptera.

- Classification of following insect order

(a) hymenoptera (b) lepidoptera (c) coleoptera

- Collection and preservation of insects.

Unit-2

- Insect pest-Management strategies and tools
- Biological control, Genetic control, Chemical control
- Pests of Cotton
- Pests of sugarcane
- Pests of paddy
- Pests of stored food grains
- Pests of citrus fruits and mango
- Pests of pulses
- House hold insect pests

Unit-3

- Insects in relation to forensic science
- Insects migration, population fluctuation and factors
- Insects of medical and veterinary importance
- Ecological factors affecting the population and development of Insects

Unit-4

- Mulberry and non mulberry sericulture
- Apiculture
- Lac culture
- Insects as human food for future.

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M. Sc. Zoology Semester-IV
Paper- IV D (Optional)
Environment & Biodiversity Conservation

Unit I

- Basic concept of Environmental Biology Scope and Environmental Science
- Biosphere and Biogeochemical cycles.
- Environmental monitoring and impact assessment.
- Environmental and sustainable development.
- Water conservation, rain water harvesting, water shed management.

Unit II

- Cause, effects and remedial measure of Air pollution, Water pollution.
- Noise. radioactive and thermal pollution.
- Agriculture pollution
- Basic concepts of Bioaccumulation.
- Solid waste management.

Unit III

Global warming and disaster management

- Cause of global warming
- Impact of global warming – acid rains and ozone depletion, green house effect.
- Control measures of global warming
- Afforestation (b) reduction in the use of CFCS
- Disaster management -floods, earthquake, Cyclones landslides.
- Environmental legislation.

Unit IV

Natural Resources:- Forest-

- Use and over exploitation of forests.
- Timber extraction. Land
- Land degradation. Landslides.
- Soil-ersion and desertification. Water
- Use and over utilization of surface and ground water
- Floods. Drought dams- benefits and problems Mineral
- Use and exploitation ,
- Environmental effect of extracting and using mineral resources Food
- World food problem
- Effects of modern agriculture and overgrazing Energy
- Conventional and nonconventional energy resources.
- Using of alternate energy sources

- Role of an individual in conservation of natural resources Equitable use of resources for sustainable life

- Biodiversity crisis – habitat degradation poaching of wild life.
- Socio economic and political causes of loss of biodiversity.
- In situ and exsitu conservation of biodiversity
- Value of biodiversity.

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Suggested Reading Materials: Paper III D & IV D

- Arora: Fundamentals of environmental biology
- Anathakrishnan : Bioresources ecology
- Bottain : Environmental studies
- Bouhey : Ecology of populations
- Clark : Elements of ecology
- Dowdoswell : An introduction to animal ecology
- Goldman : Limnology
- Kormondy : Concepts of ecology
- May : Model ecosystems
- Odum : Ecology
- Perkins : Ecology
- Simmons : Ecology of estuaries and costal water
- Pawlosuske : Physico-chemical methods for water
- South Woods : Ecological methods
- Trivedi and Goel : Chemical and biological methods for water pollution studies
- Willington : Fresh water biology
- Wetzal : Limnology
- Welch : Limnology Vols. I-II

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M.S c Zoology Semester-IV
Paper- IV E (Optional)
Molecular Endocrinology and Reproductive Technology

UNIT-1

- Definition and scope of molecular endocrinology.
- Chemical nature of Hormones-
- Protein & polypeptides.
- Amino acid derivative
- Steroids
- Phospholipids derivative
- (tissue hormones)
- Purification and characterization of Hormones.

UNIT-2

- Receptor.
- Membrane Receptor.
- Nuclear Receptor.
- Orphan Receptor
- G-Protein
- Nuclear Receptor

UNIT-3

- Hormone – Transduction
- G-Protein & Cyclic Nucleosides.
- Calcium calmoduline & phospholipids.
- Miscellaneous Second Messengers.
- Phosphorylation & other non transcriptional effect of Hormones.
- Genetic control of formation of Hormone.
- Transcription.
- Post transcription.
- Translation.
- Post translation
- Secretion of Hormone.

UNIT-4

- Multiple ovulation and embryo transfer Technology.
- Study of estrous cycle by vaginal smear technology
- Surgical technique-
- Castration
- Ovariectomy
- Vasectomy
- Tuectomy
- Laprotomy.

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Suggested Reading Materials:

- Benjamin Lewim – Genes VII/ VIII, oxford University press.
- Lodish etal- Molecular Cell Biology.
- Zarrow, M.X., Yochin J.M. and Machrthy, J.L. – Experimental Endocrinology.
- Chatterji C.C.- Human Physiology (Vol- II).
- Bentley, P.J. – Comparative Vertebrate endocrinology.
- Hadley Mac. E.- Endocrinology.
- Chinoy, N.J. Rao, M.V., Desarai, K.J. and High land, H.N. – Essential techniques in reproductively
- physiology and Endocrinology.
- Norris, D.O. – Vertebrate Endocrinology.

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M.Sc. ZOOLOGY – IV SEMESTER
LAB COURSE-I (COMPULSARY)

PAPER- I BIOCHEMSTRY

1. Estimation of antioxidant enzymes.
2. Estimation of amylase. analitatative shudy of a my lase
3. analitatative study of protem
4. analitatative study of CBH
5. Estimation of protein by Lowry method.
6. Estimation of Oil in seeds.
7. Estimation of Carbohydrate by anthrone reagent.
8. Other exercise related to theory paper.

PAPER- II NEUROPHYSIOLOGY

1. Study of slides of nervous system.
2. Neck nerve of squirrel by using alternate methods like clay modeling.
3. Study of Brain through Model.
4. Study of Cranial nerve of Bird, Amphibian, Reptile and Mammals by using alternate methods like clay modeling.
5. Other exercise related to theory paper.

EXAMINATION SCHEME

Based on paper I	35 marks
Based on paper II	35 marks
Viva	10 marks
Sessional (Internal)	20 mark
Total	**80+20 (100)**

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M.Sc. SEMESTER-IV
LAB COURSE-II
OPTIONAL (SPECIAL PAPER) GROUP 1

PAPER-III(A) FISH (ICHTHYOLOGY) STRCTURE AND FUNCTION

1. Anatomy of various organ systems and mounting of fish materials
2. Cranial nerves of teleost fishes: *Wallago , Mystus, Labeo* and other fishes by using alternate methods like clay modeling
3. Osteology of fish: Scoliodon, carps, catfishes, murrels etc.
4. Accessory respiratory organs of air breathing fish by using alternate methods like clay modeling
5. Study of histological (permanent) slides
6. Study of museum specimens of the concerned group
7. Other exercise related to theory paper.

PAPER –III(B) CELL BIOLOGY

1. Study of mitosis from onion root tip.
2. Study of meiosis in grasshopper testis.
3. Study of polytene chromosome in Dipteran Larvae.
4. Demonstration of Barr-Body in Human Check cell.
5. Estimation of DNA.
6. Estimation of RNA.
7. Other exercise related to theory paper.

PAPER –III(C) ENTOMOLOGY

1. Anatomy of common grasshopper, cockroach, honey bee, wasp and dysdercus, mylabris, belestoma (Giant water Bugs) by using alternate methods like clay modeling.
2. Dissection by using alternate methods like clay modeling and exposure of:
   (i) Sting apparatus of honey bee and wasp.
   (ii) Tympanal organs of grasshoppers.
   (iii) Testes of cockroach
   (iv) Aristae of house fly.
   (v) Different types of mouthparts of insects.
   (vi) Different types of wings and antennae of insects.
   (vii) Tentorium of grasshoppers.
3. Identification and comment on insects of different orders and families.
4. Identification with the help of keys of common insects from different orders and families.
5. Other exercise related to theory paper.

PAPER-III(D) WILD LIFE CONSERVATION

1. Anatomy of (by using alternate methods like clay modeling):
(a) Toad / Frog.
(b) Lizard / Snake / Turtle.
(c) Pigeon / Parrot.
(d) Rat / Squirrel.
2. Ecological survey of National Parks and Sanctuaries.
3. Mounting: Permanent preparation of parts of internal organs.
4. Study of slides of different microscopic structure.
5. Identification of wild animal species as objects of museum and zoo and specimens of photographs.
6. Osteology of wild animals.
7. Ecological comments on wild species of different niche and habits. Candidates would be required to keep records of exercise in laboratory, field types, sanctuaries and parks of importance and collections.
8. Other exercise related to theory paper.

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PAPER-III(E) BIOLOGY OF VERTEBRATE IMMUNE SYSTEM

1. Dissection by using alternate methods like clay modeling of primary and secondary immune organs from mice:
   a. Preparation of single cell suspension from bone marrow and spleen (spleenocytes) of mice.
   b. Cell counting and viability testing of the spleenocytes prepared.

   2. Preparation and study of phagocytosis by spleenic/peritoneal macrophages.

   3. Raising polyclonal antibody in mice, serum collection and estimating antibody title in serum by following methods:

   a. Ouchterlony (double diffusion) assay for Antigen -antibody specificity and title.
   b. ELISA

   4. Antibody purification from the serum collected from immunized mice:
   affinity purification/chromatography.

   5. Immunoelectrophoresis.

   6. Demonstration of Western blotting:
   a. Protein estimation by Lowry's method /Bradford's method
   b. SDS-PAGE.
   c. Immunoblot analysis.
   7. Other exercise related to theory paper

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OPTIONAL (SPECIAL PAPER) GROUP 2

PAPER –IV(A) PISCI CULTURE AND ECONOMIC IMPORTANCE OF FISH (ICTHYOLOGY)

1. Systematic identification of freshwater fishes with particular reference to C.G.
2. Age determination with the help of scales / otolith
3. Pigmentary behaviour in fish
4. Qualitative zooplankton analysis
5. Nutrient analysis of water
6. Analysis of gut contents
7. Microtomy of fish materials
8. Other exercise related to theory paper

PAPER-IV(B) CELLULAR ORGANIZATION AND MOLECULAR ORGANIZATION

1. Histochemical demonstration of Mitochondria
2. Histochemical demonstration of Golgi complex
3. Histochemical demonstration of Lactate dehydrogenase
4. Histochemical demonstration of Succinate dehydrogenase
5. Isolation and characterization of Nuclei from liver
6. Isolation and characterization of Mitochondria
7. Isolation of DNA from any tissue
8. Separation of lipids using thin layer chromatography
9. Separation of various proteins using column chromatography
10. Study of metaphase chromosomes from rat bone marrow
11. G banding of metaphase chromosomes
12. C- banding of metaphase chromosomes
13. Estimation of Mitotic Index
14. Measurement of cell size using oculometer.
15. Other exercise related to theory paper

PAPER- IV(C) APPLIED ENTOMOLOGY

1. Insect collection and preservation for systematic studies
2. Identification of different insects upto orders
3. Identification of insects upto families of economically important insect orders
4. Identification of insects upto species: Mosquitoes, honeybees, stored grain beetles, aquatic insects, important crop and household pests
5. Analysis of honey and its quality control
6. Field studies of insects to understand their habit, habitat environmental impact, beneficial and harmful activities etc.
7. Study of beneficial insects, benefits derived from them and useful products
8. Study of destructive insects, damage caused by them and damaged products
9. Study of insecticidal formulations and insect control appliances
10. Experiments on insect control like LC-50 /LD-50, knock down and recovery effect, repellency/antifeedance tests, percentage damage tests for leaf eating insects, and stored grain pests 11.Other exercise related to theory paper

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PAPER- IV(D) ENVIRONMENT AND BIODIVERSITY CONSERVATION

(i) Environmental hazards, destruction of habitat and extrication of species causes and preventive measures.
(ii) Environmental planning of rural and urban development.
(iii) Management of soil resources.
(iv) UNESCO's role in ecology, earth summit, SARC, ED trust fund.
(v) Biodiversity, its significance and conservation measures.
(vi) Role of biodiversity in species development.
(vii) Other exercise related to theory paper

PAPER- VI(E) MOLECULAR ENDOCRINOLOGY AND REPRODUCTIVE TECHNOLOGY

1. Chromatography method (separation of Androgen & Progesterone).
2. Bioassay of α-Ketosteroids.
3. Bioassay of Gonadotropins.
4. Study of slide related to endocrine glands.
5. Estimation of cholesterol.
6. Estimation of catecholamine.
7. Dissection by using alternate methods like clay modeling of endocrine glands.
8. Other exercise related to theory paper.

EXAMINATION SCHEME

Based on paper III	35 marks
Based on paper IV	35 marks
Viva	10 marks
Sessional (Internal)	20 mark
Total	**80+20 (100)**

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
P.G.D.C.A. Semester Exam

UNDER

FACULTY OF COMPUTER SCIENCE

Session 2019-20

(Approved by Board of Studies)
Effective from June 2019

POST GRADUATE DIPLOMA IN COMPUTER APPLICATION, 2019-2020

16.05.19

16/5/19

[DURATION - ONE YEAR - FULL TIME]

The duration of the course shall be one year consisting of two semesters. There shall be three theories and two practical courses in the each semester.

FIRST SEMESTER

PGDCA-101 : Introduction to software organization
PGDCA-102 : Programming in "C"
PGDCA-103 : Office Automation & Tally
PGDCA-104 : Practical based on PGDCA-103.
PGDCA-105 : Practical based on PGDCA-102.

PGDCA-101

INTRODUCTION TO SOFTWARE ORGANISATION

UNIT – I: Introduction to Computers

Computers – Introduction, Computer System Characteristics, Strength and Limitations of Computer, Development of Computers, Types of Computers, Generations of Computers.
Introduction to Personnel Computers – Uses of PC's, Components of PC's, Evolution of PC's, Developments of Processors, Architecture of Pentium IV, Configuration of PC's; Input Device; Output Devices.

UNIT – II : Computer Organization

Central Processing Unit – Arithmetic Logic Unit, Control Unit, Registers, Instruction Set, Processor speed. Storage Devices – Storage and its need, Storage Evaluation Units, Primary Storage, Secondary Storage, Data Storage and Retrieval Systems, SIMM, DIMM, Types of Storage Devices.

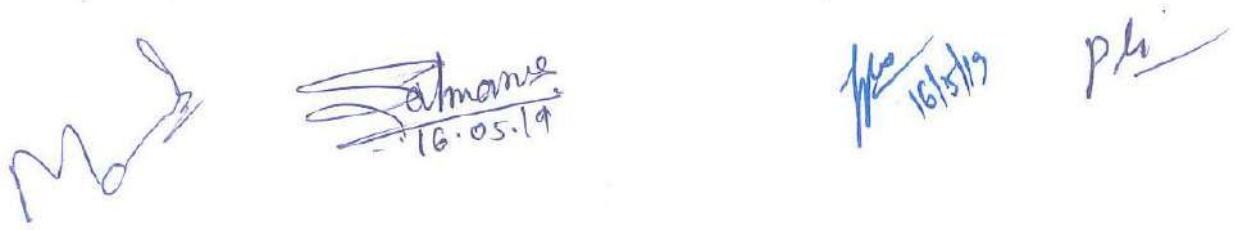
UNIT – III : Computer Software

Basics of Software – needs of Software, Types of Software; Free Domain Software; Open Source Software; Compiler, Interpreter and Assembler; Linker and Loader; Debugger; Integrated Development Environment; Operating System – Introduction, Uses of OS, Functions of OS, Booting process, Types of Reboot, Booting from different OS, Types of OS, DOS, Windows, Linux.

UNIT – IV: Programming Languages – Introduction, Comparison between Human and Computer Language; Program; Data, Information and Knowledge; Characteristics of Information; Types of Programming Languages; Generations of Languages; Program Development Steps; Programming Paradigms; Object-Oriented Programming; Structured Programming, Functional Programming, Process Oriented Programming.

UNIT – V : Communication, Networks and Internet

Communication – Introduction, Communication process, Communication Types, Communication Protocols, Communication Channels/Media. Networks – Introduction; Types of Network; Topology; Media - NIC, NOS, Bridges, HUB, Routers, Gateways. Internet – Introduction, Growth of Internet, Owner of Internet, Internet Service Provider, Anatomy of Internet, ARPANET and Internet History of World Wide Web, Services Available on Internet - File Transfer Protocol, Gopher, E-mail, Telnet, Newsgroups, WWW, Applications of Internet.



Books Recommended

1. Using IT : Williams T MHill
2. Essentials of Information Technology : A. Mansoor, Prgya Publications
3. IT : Curtin T MHill
4. Fundamental of Information Technology : Chetan Shrivastava_Kalyani Publishers
5. Computer Fundamentals : P.K Sinha BPB Pubications
6. Fundamental of Computer : V. Rajaraman
7. Computer today : Sanders D.H

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PGDCA-102

PROGRAMMING IN 'C'

UNIT – I: Introduction:

Introduction Character set, Identifiers and Keywords, Variables, Displaying variables, Reading Variables, Character and Character String, Qualifiers, Type define Statements, Value initialized variables, Constants, Constant Qualifier, Operators and Expressions, Operator Precedence and Associativity, Basic input output: Single Character I/O, Types of Characters in format string, Scanf with specifier.

UNIT – II : Control Structures -

Control Structure: If - statement, If -else statement, Multi decision, Compound Statement, Loops: For - loop, While -loop, Do-While loop, Break statement, Switch statement, Continue statement, Go to statement.

UNIT – III: Functions & Arrays-

Functions: Function main, Functions accepting more than one parameter, User defined and library functions, Concept associatively with functions, function parameter, Return value, recursion comparisons of Iteration and recursion variable length argument list.

Arrays: Scope and Extent, Multidimensional Arrays, Array of Strings, Function in String, passing arrays to functions, accessing array inside functions.

UNIT – IV Pointes

Pointers: Definition and use of pointer, address operator, pointer variable, referencing pointer, void pointers, pointer arithmetic, pointer to pointer, pointer and arrays, pointer and functions, pointers and two dimensional arrays, array of pointers, pointers constants, pointer and strings.

UNIT – V: Structure and Union -

Declaring and using Structure, Structure initialization, Structure within Structure, Operations on Structures, Array of Structure, Array within Structure, Creating user defined data type, pointer to Structure and function. Union, difference between Union and Structure, Operations on Union, Scope of Union.

Suggested Books:-

1. Letus C - Yashwant Kanetkar.
2. Programming in C - E. Balaguruswamy

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PGDCA-103

OFFICE AUTOMATION & TALLY

UNIT – I: Windows Concept

Windows Concepts, Features, Structure, Desktop, Icons, Taskbar, Start Menu, My Computer, Recycle Bin, My document, creating shortcut. Accessories: Calculator, Notepad, Paint, Word Pad, Character Map. Windows Explorer: Creating files & folders and other Explorer facilities, Object Linking & Embedding. Communication: Dialup Networking, Phone Dialer. Difference among windows versions.

UNIT – II : Word Processing & Spreadsheet

Word **:** Creating, Editing, & Previewing Documents, Formatting, Advanced Features, Using Thesaurus, Mail Merge, Table & Charts, Handling Graphics, Converting Word Documents into other Formats.
Excel: Worksheet Basics, Creating, Opening, & Moving in Worksheet, Working with Formula & Cell referencing, Absolute & Relative addressing, Working with Ranges, Formatting of Worksheet, Graphs & Charts, Database, Function, and Macros.

UNIT – III: Power Point

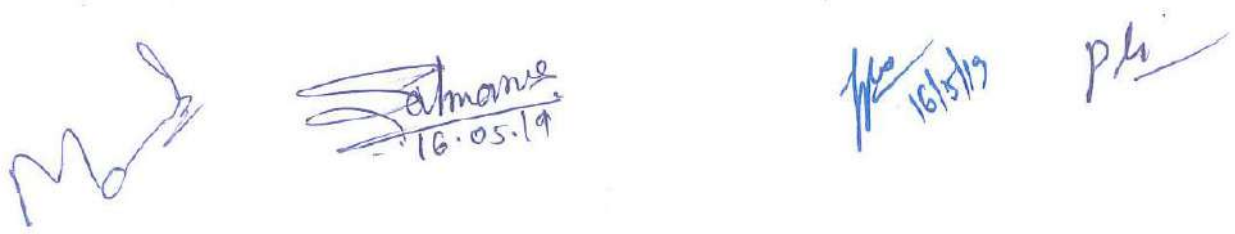
Power Point: Creating a presentation, Modifying visual Elements, Adding objects, Applying Transitions, animations and linking, preparing handouts, presenting a slide show. Creating presentation, working with slides, different types of slides, setting page layout, selecting background and applying design, adding graphics to slide, adding sound and movie, working with table, creating chart and ginih, playing a slide show, slide transition, advancing slides, setting time, rehearsing timing, animating slide, animating objects, running the show from windows.

UNIT – VI: Access

Introduction to MS Access, The Tables of a Database, Introduction to the Record of a Table, Introduction to Controls Design, Details on Controls Design, The Characteristics of a Table, The Characteristics of a Form, The Characteristics of a Window Control, Data Controls, Introduction to Data Expressions, Getting Assistance With Data Entry, Database Strings, Database Numeric Values, Database Conditional Values, Database Date and Time Values, Creating Reports, Characteristics of Reports. Multiple queries and switch boards manager.

UNIT – V:Tally

Setting up Ledger &Groups. Study of recording of transactions in the 'Voucher'. (According to Golden rules). Study of 'Final A/C preparation & displaying in different mode/format'. Study of alteration & Deletion of ledger/Groups. Study of cash & fund flow, day book, sales register, purchase register, bills receivable/Payable etc. Study of data security & backing up data. Outline of entry for Income Tax, ED, VAT, ST/CST, PF, Gratuity, Bonus, Loans & Depreciation etc.



PGDCA-104: Practical based on PGDCA-103

1. Scheme of Examination: -

Practical examination will be of 3 hours duration. The distribution of practical marks is as follows :

Question1(Word)	-	15
Question 2 (Excel/ Power point)	-	15
Question3(Access)	-	15
Question4(Tally)	-	15
Viva-Voice	-	20
[Practical Copy +InternalRecord]	-	20
Total	-	**100**

2 In every program there should be comment for each coded line or block ofcode.

3 Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.

4 All the following programs or a similar type of programs should beprepared.

List of Practical

1. At least 10 practical Questions in Word
2. At least 10 practical Questions in Excel
3. At least 5 practical Questions in Powerpoint
4. At least 10 practical Questions in Access
5. At least 5 practical Questions in Tally

PGDCA-105 :Practical based on PGDCA-102

1 Scheme of Practical Examination:-

Practical examination will be of 3 hours duration. All programe with flowchart & algorithms. The distribution of practical marks is as follows and

Question 1 (with flowchart & algorithms)	-	20
Question 2 (with flowchart & algorithms)	-	20
Question 3 (with flowchart & algorithms)	-	20
Viva-Voice	-	25
[Practical Copy + Internal Record]	-	15
Total	-	**100**

2 Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.

3 In every program there should be comment for each coded line or block of code.

4 Alltheprogramsorasimilartypeofprogramsshouldbepreparedasperthepracticallist.

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List of Practical

INPUT AND OUTPUT, FORMATTING

1. Write a program in which you declare variable of all data types supported by C language. Get input from user and print the value of each variable with alignment left, right and column width 10. For real numbers print their values with two digits right to the decimal.

LOOPS, DECISIONS

2. Write program to print all combination of 1 23.
3. Write program to generate following pattern)

```
* * * * *
  * * * *
    * * *
      * *
        *
```

c)

```
        *
      * *
    *  * *
  *  *  * *
*  *  *  * *
```

b)

```
1
2 3
4 5 6
7 8 910
```

d)

```
          1
        2 1 2
      3 2 1 23
    4 32 1 2 34
```

4. Write main function using switch…case, if.. else and loops which when called asks pattern type; if user enters 11 then first pattern is generated using for loop. If user enters 12 then first pattern is generated using while loop. If user enters 13 then first pattern is generated using do-while loop. If user enters 21 then a second pattern is generated using for loop and so on.
5. Write program to display number 1 to 10 in octal, decimal and hexa decimal system.
6. Write program to display number from one number system to another number system. The program must ask for the number system in which you will input integer value then the program must ask the number system in which you will want output of the input number after that you have to input the number in specified number system and program will give the output according to number system for output you mentioned.
7. Write a program to perform following tasks using switch…case, loops and conditional operator (a sand when necessary).

   a) Find factorial of a number

   b) Print fibonacci series up to n terms and its sum.

   c) Print sin series up to n terms and its sum.

   d) Print prime numbers up n terms.

   e) Print whether a given year is leap or not.

8. Write program no. 6 but use library function to perform above tasks.

ARRAY

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9. Create a single program to perform following tasks using switch, if. Else, loop and single dimension character array without using library function:

   a) To reverse the string.
   b) To count the number of characters in string.
   c) To copy the one string to other string;
   d) To find whether a given string is palindrome or not.
   e) To count no. of vowels, consonants in each word of a sentence and no. of punctuation in sentence.
   f) To arrange the alphabets of a string in ascending order.

10. Create a single program to perform following tasks using switch, if. Else, loop and single dimension integer array:

    a) Sort the elements.

11. Write a program that read the afternoon day temperature for each day of the month and then report them on the average temperature as well as the days on which hottest and coolest days occurred.

12. Create a single program to perform following tasks using switch, if. Else, loop and double dimension integer array of size 3x3:

    a) Addition of two matrix.

    b) Subtraction of two matrix.

    c) Multiplication of two matrix.

13. Create a single program to perform following tasks using switch, if..else, loop and double dimension character array of size 5x40:

    a) Sorting of string.

FUNCTIONS

14. Write program using the function power (a, b) to calculate the value of a raised to b.

15. Write program to demonstrate difference between static and auto variable.

16. Write program to demonstrate difference between local and global variable.

17. Write a program to perform following tasks using switch…case, loops and function.

    a) Find factorial of a number
    b) Print Fibonacci series up to n terms and its sum.

18. Write a program to perform following tasks using switch…case, loops and **recursive** function.

    a) Find factorial of a number

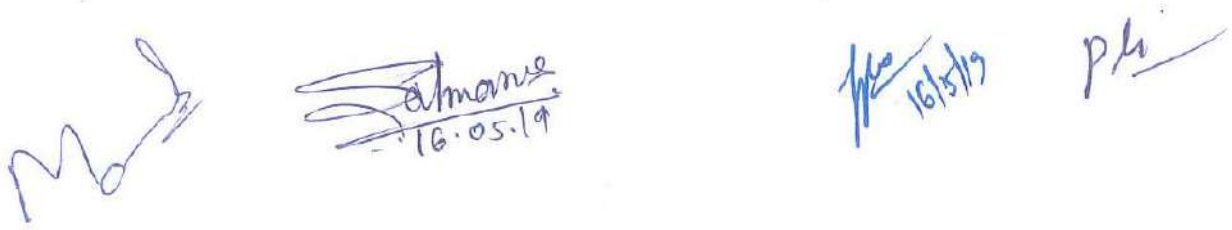
    b) Print Fibonacci series up to n terms and its sum.

19. Write a function to accept 10 characters and display whether each input character is digit, uppercase letter or lower case letter.

STRUCTURE & UNION

20. Create a structure Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks. Declare a structure variable of student. Provide facilities to input data in data members and display result of student.

21. Create a structure Date with data member's dd, mm, yy (to store date). Create another structure Employee with data members to hold name of employee, employee id and date of joining (date of joining



will be hold by variable of structure Date which appears as data member in Employee Structure). Store data of an employee and print the same.

22. Create a structure Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks. Declare array of structure to hold data of 3 students. Provide facilities to display result of all students. Provide facility to display result of specific student whose roll number is given.

23. Write program to create structure complex having data members to store real and imaginary part. Provide following facilities:

    a) Add two complex nos. using structure variables.

    b) Subtract two complex nos. using structure variables.

Use structure as argument to function and function returning structure.

POINTER

24. Define union Emp having data members:-one integer, one float and one single dimension character array. Declare a union variable in main and test the union variable.

25. Define an enum Days_of_Week members of which will be days of week. Declare an enum variable in main and test it.

26. Write a program of swapping two numbers and demonstrates call by value and call by reference.

27. Write program to sort strings using pointer exchange.

28. Write a program in c using pointer and function to receive a string and a character as argument and return the no. of occurrences of this character in the string.

29. Create a program having pointer to void to store address of integer variable then print value of integer variable using pointer to void. Perform the same operation for float variable.

30. Write program to find biggest number among three numbers using pointer and function.

31. Write program to Create a structure Employee having data members to store name of employee, employee id, salary. Use Pointer to structure to store data of employee and print the stored data-using pointer to structure.

32. Write program to Create a structure Employee having data members to store name of employee, employee id, salary. Use Pointer to structure to simulate dynamic array of structure store data of n employees and print the stored data of n employees using pointer to structure.

33. Write a program to sort a single dimension array of integers of n elements simulated by pointer to integer. Use function for sorting the dynamic array.

34. Write a program to sum elements of a double dimension array of integers of m rows and n columns simulated by pointer to pointer to integer. Use function for sum the elements of the dynamic array.

35. Write program to demonstrate difference between character array and pointer to character.

36. Write program to demonstrate difference between constant pointer and pointer to constant.

37. Write program to demonstrate pointer arithmetic.

38. write program to demonstrate function-returning pointer.

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POST GRADUATE DIPLOMA IN COMPUTER APPLICATION, 2019-2020
[DURATION - ONE YEAR - FULL TIME]

The duration of the course shall be one year consisting of two semesters. There shall be three theories and two practical courses in the each semester.

Second Semester: **PGDCA-106 : GUI - Programming in Visual Basic.**
PGDCA-107 : Database Management System
PGDCA-108 : Essential of E –Commerce & HTML .
PGDCA-109 : Practical based on PGDCA106, PGDCA107 &PGDCA-108
PGDCA-110 : Project

PGDCA-106
GUI - PROGRAMMING IN VISUAL BASIC

UNIT – I

Introduction to visual Basic - Editions of Visual Basic, Event Driven Programming, Terminology, Working environment, project and executable files ,Understanding modules, Using the code editor window, Other code navigation features, Code documentation and formatting, environment options, code formatting option, Automatic code completion features.

Creating Programs - Introduction to objects, Controlling objects, Properties, methods and events, Working with forms, Interacting with the user: MsgBox function, InputBox function, Code statements, Managing forms, Creating a program in Visual Basic, Printing.

UNIT – II

Variable and Procedures - Overview of variables, Declaring, Scope, arrays, User-defined data types, constants working with procedures, Working with dates and times, Using the Format function, Manipulating text strings.

Controlling Program Execution - Comparison and logical operators, If…Then statements, Select Case Statements looping structures, Using Do…Loop structures, For…Next statement, Exiting aloop.

UNIT – III

Working with Controls - Types of controls, Overview of standard controls, ComboBox and ListBox, OptionButton and Frame controls Menu, Status bars, Toolbars, Advanced standard controls, ActiveX controls, Insert table objects, Validation.

Error Trapping & Debugging - Overview of run-time errors, error handling process, The Err object, Errors and calling chain, Errors in an error-handling routine, Inline error handling, Error-handling styles, General error-trapping options Type of errors, Break mode Debug toolbar, Watch window, Immediate window, Local window, Tracing program flow with the Call Stack.

UNIT – IV

Sequential and Random Files - Saving data to file, basic filling, data analysis and file, the extended text editor, Random access file, The design and coding.

Data Access Using the ADO Data Control - Overview of ActiveX data Objects, Visual Basic data access features, Relational database concepts Using the ADO Data control to access data, Overview of DAO, RDO, Data Control, structured query language (SQL), Manipulating data Using Data Form Wizard.

UNIT – V

Report Generation - Overview of Report, Data Report, Add groups, Data Environment, Connection to database Introduction to Crystal Report Generator.

Advances Tools - Overview of drag and drop, Mouse events, Drag-and drop basics, Date Time Control, Calendar, Print Dialog, MDI (Multiple Document Interface).

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BOOK RECOMMENDED:

Mastering Visual Basic 6Fundamentals – By Microsoft Mastering
in Visual Basic – By BPB Publications.
Introduction to VB Programming – V. K. Jain

PGDCA-107
Database Management System

UNIT – I : Introduction To DBMS

Data, Information and knowledge, concept of DBMS, Advantages of DBMS, data independence, database administration roles, DBMS architecture, different kinds of DBMS users, importance of data dictionary, contents of data dictionary, types of database languages. Data models: network, hierarchical, relational, Introduction to ODBC concept.

UNIT – II : E-R Model

Entity - Relationship model as a tool for conceptual design-entities, attributes and relationships. ER diagrams; Concept of keys; Case studies of ER modeling Generalization; specialization and aggregation.

UNIT – III: Relational Model

Structure to Relational Database, Relational Algebra, Extended Relational- Algebra Operation, Simple and complex queries using relational algebra, The Domain Relational Calculus, Tuple relational calculus.

UNIT – IV : Relational Database Design

Pitfalls in Relational Database Design, Decomposition, Functional Dependencies, Normalization: 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT – V : Structured Query Language :

DDL and DML: Creating Table, Specify Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting, Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views: What is Views, Create, Drop and Retrieving data from views. **Security**: - Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

Suggested Books:

1. Data base system : Korth & Silberschatz.
2. Data Base Management System : Alexies & Mathews
3. An Introduction to Database System : C.J. Date
4. Data Base Management System : Raguramakrishnan.
5. Data Base Management System : Elmasri & Nawathe.

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PGDCA-108
ESSENTIALS OF E –COMMERCE & HTML

UNIT – I

Introduction to Electronic Commerce –The scope of E-commerce; Size, growth and future projection of E-commerce market Worldwide and in India; Internet and its impact on traditional businesses; Definition of E-commerce; Business models in E –Commerce environment; Case studies. *Emergence of E-commerce* - E-commerce on private networks, Electronic Data Interchange (EDI), What is EDI, EDI in action, EDI basics, EDI standards, financial EDI, FEDI for international trade transaction, FEDI payment system within the US, ACH credit transfer payment system FEDI, application of EDI, benefits of EDI, Electronics Payment system, E-commerce on the web, E-commerce in India,

UNIT – II

Internet, Security and E-Commerce: Security of Data/Information in Internet/web environment; Client security, Network security; Virus protection and Hacking; Security Measures: Authentication, Integrity, Privacy, Non-repudiation; Public information, Private information, firewall tunnels, encryption,

secret key encryption, public key encryption, digital signature. Business–to-Business (B2B), Business-to-Consumer (B2C); Business-to-Business-to-Consumer (B2B2C) and Consumer-to-Consumer (C2C) E-Commerce

UNIT – III

HTML Basics & Web Site Design Principles –Concept of a Web Site, Web Standards, What is HTML? HTML Versions, Naming Scheme for HTML Documents , HTML document/file, HTML Editor , Explanation of the Structure of the homepage , Elements in HTML Documents ,HTML Tags, Basic HTML Tags, Comment tag in HTML, Viewing the Source of a web page, How to download the web page source? XHTML, CSS, Extensible Markup Language (XML), Extensible Style sheet language (XSL), Some tips for designing web pages, HTML Document Structure. HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META ,<TITLE> Element,<SCRIPT> Element ,Practical Applications, *HTML Document Structure-Body Section:-* Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin ,Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements -- Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements -- Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG),Lists ,ADDRESS Element, BLOCKQUOTE Element, TABLE Element ,COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles, Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

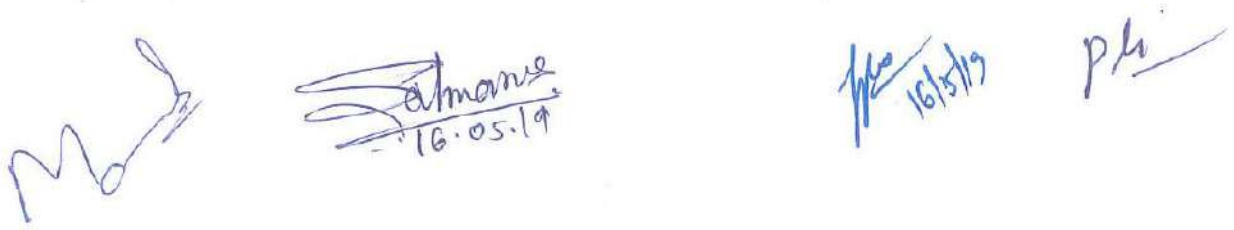
UNIT – IV

Image, Internal and External Linking between Web Pages - Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER. Insertion of images using the element IMG (Attributes: SRC (Source), WIDTH, HEIGHT, ALT (Alternative), ALIGN), IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages. Hypertext Anchors, HREF in Anchors, Links to a Particular Place in a Document, NAME attribute in an Anchor ,Targeting NAME Anchors ,TITLE attribute, Designing Frames in HTML.

UNIT – V

Creating Business Websites with Dynamic Web Pages – Concept of static web pages and dynamic web pages. Hosting & promotion of the web site, Domain Name Registration, Web Space allocation, Uploading / Downloading the website- FTP, cute FTP. Web Site Promotion Search Engines, Banner Advertisements.

Recommend Books –



1. Business on the net - by Kamlesh N. Agarawala , Amit Lal & Deeksha Agarawal (Macmillan India Ltd.).
2. Introduction to HTML by Kamlesh N. Agarwala, O.P.Vyas, Prateek A. Agarwala. (Kitab Mahal Publications).
3.. ASP Developer's Guide – by Greg Buczek (TATA McGraw Hill).
4. Information Technology Act 2000: www.mit.gov.in/it-bill.htm

PGDCA-109: Practical based on PGDCA106, PGDCA107 & PGDCA108

1 Scheme of Examination:-

Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows

Question 1(VB)	-	15
Question 2(VB)	-	15
Question 3(SQL)	-	15
Question 4(HTML/Web Design)	-	15
Viva	-	25
[Practical Copy + Internal Record]	-	15
Total	-	**100**

2 In every program there should be comment for each coded line or block of code

3 Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.

4 All the following programs or a similar type of programs should be prepared

List of Practical of Visual Basic

1. WAP to perform arithmetic operation **using command buttons**. (**Declare variables globally**).
2. WAPtotakeinputofprincipal,rate&timeandcalculatesimpleinterest&compoundinterest.
3. Write a program to take input of x and print table of x in the following

   format. X * 1 =X
   X * 2 = 2X

   X * 10 = 10*X
4. Design an interface, which will appear like marksheet. It will take input of marks in five subjects and calculate total marks and percentage then provide grade according to following criteria. (**Using nested if**) (Use tab index property to move focus).

If %	Then Grade
>=90	A+
> = 75 &<90	A
> = 60 &<75	B
> = 45 &<60	C
Otherwise	F

5. WAP to create a simple calculator (**Using control array)**
6. Write a program to check whether ancentered no. is prime or not.**(Using for loop & Exit for)**
7. Write a program which will count all vowels, consonants, digits, special characters and blank spaces in a sentences (Using **select case**)
8. WAP to illustrate all functionalities of **listbox** and **combobox**.
9. WAP using **check boxes** for following font
   effects. Bold
   Italic
   Underline
   Increase font size
   Decrease font size
   Font color
10. WAP for temperature conversion using **optionbutton**.

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11. WAP to launch a rocket using **pictures box** and **timer control**.
12. WAP to change back color of any control (label, textbox) using **scroll box**.
13. WAP to search an element for a **one dimension static array**.
14. WAP to sort a dynamic array
    of (a)n numbers
    (b)n strings (Input array size at run time)
15. WAPtotakeinputoftwomatricesandperformtheiraddition,subtractionandmultiplicationusing **menu editor**.
17. WAP to illustrate **call by value and call by reference** (to swap to values)
18. Write a program to calculate factorial of a number using **user defined function.**
19. Take input of a word and WAP to check whether it is a palindrome or not. **(Without using structure fun)**
20. WAP to find smallest among given three numbers using **user defined procedures**.
21. WAP to generate, print and find sum of first n elements of fibonacci series using **recursion**.
22. WAP to perform read write operations in a **sequential file**.
23. Create a **user defined data type** having fields name (as string of length 20 bytes), Roll no (as integer), class (as string of 10 bytes). WAP to create a **random access file** to store above data and perform following operations in this file.

(a) Write new record (b) Read / display existing record (c) Delete any record (d)Search any record (e) close the file (f) Lists elected records

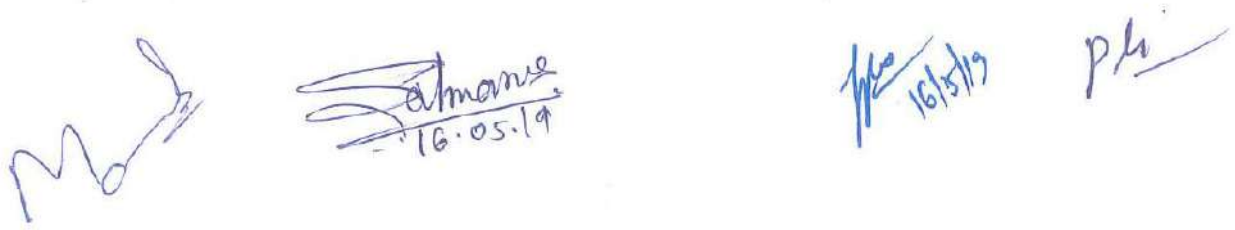
24. WAP to display records of a table using **DAO & bound control** code for buttons to move at first record, next record, previous record, last record in the table.
25. Create a table using **visual data manager** and write a program using **RDO** &**advanced bound control** to add, delete, edit & navigate records.
26. WAP to access a database using **ADO &**display a key column in the combo box or list box when an item is selected in it, its corresponding records is shown in **MSH flexgrid.**
27. Using **Data Environment** create a program to display records of any table.
28. WAP to generate marksheet of students in a class through **data report**.
29. WAP to illustrate various **key board and mouse events**.
30. Using **drive, directory and file list box** (it will show only .bmp files). Let the user select the bmp files, which will appear in picture box as user click on any item in list box.
31. Using **toolbar** design an interface for string manipulation. Toolbar should have tabs to
    (a) Find length of string (b) No of blank spaces in sting (c) Reverse the string
    Also show current date & time in **status bar.**

List of Practical of SQL

1. Using the following database,
   Colleges (cname, city, address, phone, afdate)
   Staffs (sid, sname, saddress, contacts)
   StaffJoins (sid, cname, dept, DOJ, post, salary)
   Teachings (sid, class, paperid, fsession, tsession)
   Subjects (paperid, subject, paperno, pape rname)

Write SQL statements for the following –

a. Create the above tables with the given specifications and constraints.
b. Insert about 10 rows as are appropriate to solve the following queries.
c. List the names of the teachers teaching computer subjects.
d. List the names and cities of all staff working in your college.
e. List the names and cities of all staff working in your college who earn more than15,000
f. Find the staffs whose names start with 'M' or 'R' and ends with 'A' and/or 7 characters long.
g. Find the staffs whose date of joining is2005.
h. Modify the database so that staff N1 now works in C2College.
i. List the names of subjects, which T1 teaches in this session or all sessions.



j. Find the classes that T1 do not teach at present session.
   a. Find the colleges who have most number of staffs.
   b. Find the staffs that earn a higher salary who earn greater than average salary of their college.
   c. Find the colleges whose average salary is more than average salary ofC2
   d. Find the college that has the smallest payroll.
   e. Find the colleges where the total salary is greater than the average salary of all colleges.
   f. List maximum, average, minimum salary of each college
   a. List the names of the teachers, departments teaching in more than one department.
   b. Acquire details of staffs by name in a college or each college.
   c. Find the names of staff that earn more than each staff of C2College.
   d. Give all principals a 10% rise in salary unless their salary becomes greater than 20,000 in such case give 5%rise.
   e. Find all staff that do not work in same cities as the colleges they work.
   f. List names of employees in ascending order according to salary who are working in your college or all colleges.
      a. Create a view having fields sname, cname, dept, DOJ, andpost
      b. Create a view consisting of cname, average salary and total salary of all staff in that college.
      c. Select the colleges having highest and lowest average salary using above views.
      d. List the staff names of a department using above views.

2. Create the following database,
   Enrollment (enrollno, name, gender, DOB, address, phone)
   Admission (admno, enrollno, course, yearsem, date, cname)
   Colleges (cname, city, address, phone, afdate)
   FeeStructure (course, yearsem, fee)
   Payment (billno, admno, amount, pdate, purpose)
   a. Create the above tables with the given specifications and constraints.
   b. Insert about 10 rows as are appropriate to solve the following queries.
   c. Get full detail of all students who took admission this year class wise
   d. Get detail of students who took admission in Bhilai colleges.
   e. Calculate the total amount of fees collected in this session
      i) By your college ii) by each college iii) by all colleges
      a. List the students who have not payed full fee
         i) in your college ii) in all colleges
      b. List the number of admissions in your class in every year.
      c. List the students in the session who are not in the colleges in the same city as they live in.
      d. List the students in colleges in your city and also live in your city.

3. Create the following database,
   Subjects (paperid, subject, paper, papername)
   Test (paperid, date, time, max, min)
   Score (rollno, paperid, marks, attendence)
   Students (admno, rollno, class, yearsem)
      a. Create the above tables with the given specifications and constraints.
      b. Insert about 10 rows as are appropriate to solve the following queries.
      c. List the students who were present in a paper of a subject.
      d. List all roll numbers who have passed in first division.
      e. List all students in BCA-II who have scored higher than average
         i) in your college ii) in every college
      f. List the highest score, average and minimum score in BCA-II i) in your college ii)in every college

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4. Using the following database
   Colleges (cname, city, address, phone, afdate)
   Staffs (sid, sname, saddress, contacts)
   StaffJoins (sid, cname, dept, DOJ, post, salary)
   Teachings (sid, class, paperid, fsession, tsession)
   Subjects (paperid, subject, paperno, papername)

   Write SQL statements for the following –
   a. Create the above tables with the given specifications and constraints.
   b. Insert about 10 rows as are appropriate to solve the following queries.
   c. List the names of the teachers teaching computer subjects.
   d. List the names and cities of all staff working in your college.
   e. List the names and cities of all staff working in your college who earn more than15,000

5. Using the following database
   Colleges (cname, city, address, phone, afdate)
   Staffs (sid, sname, saddress, contacts)
   StaffJoins (sid, cname, dept, DOJ, post, salary)
   Teachings (sid, class, paperid, fsession, tsession)
   Subjects (paperid, subject, paperno, papername)

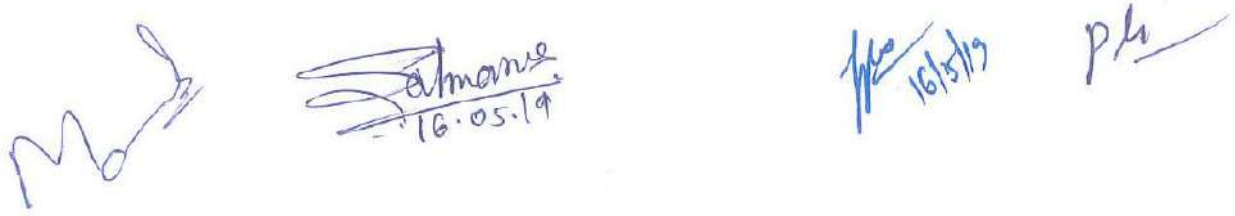
   a. Find the staffs whose names start with 'M' or 'R' and ends with 'A' and/or 7 characters long.
   b. Find the staffs whose date of joining is2005.
   c. Modify the database so that staff N1 now works in C2college.
   d. List the names of subjects which T1 teaches in this session or all sessions.

6. Using the following database
   Colleges (cname, city, address, phone, afdate)
   Staffs (sid, sname, saddress, contacts)
   StaffJoins (sid, cname, dept, DOJ, post, salary)
   Teachings (sid, class, paperid, fsession, tsession)
   Subjects (paperid, subject, paperno, papername)

   a. Find the classes that T1 do not teach at present session.
   b. Find the college who have most number of staffs.
   c. Find the staffs who earn a higher salary who earn greater than average salary of their college.
   d. Find the colleges whose average salary is more than average salary ofC2
   e. Find the college that has the smallest payroll.
   f. Find the colleges where the total salary is greater than the average salary of all colleges.
   g. List maximum, average, minimum salary of each college

7. Using the following database
   Colleges (cname, city, address, phone, afdate)
   Staffs (sid, sname, saddress, contacts) StaffJoins
   (sid, cname, dept, DOJ, post, salary)
   Teachings (sid, class, paperid, fsession, tsession)
   Subjects (paperid, subject, paperno, papername)

   a. Find the classes that T1 do not teach at present session.
   b. List the names of the teachers, departments teaching in more than one departments.
   c. Acquire details of staffs by name in a college or each college.
   d. Find the names of staff who earn more than each staff of C2college.



e. Give all principals a 10% rise in salary unless their salary becomes greater than 20,000 in such case give 5%rise.
f. Find all staff who do not work in same cities as the colleges they work.
g. List names of employees in ascending order according to salary who are working in your college or all colleges.

8. Using the following database
Colleges (cname, city, address, phone, afdate)
Staffs (sid, sname, saddress, contacts) StaffJoins
(sid, cname, dept, DOJ, post, salary)
Teachings (sid, class, paperid, fsession, tsession)
Subjects (paperid, subject, paperno, papername)

a. Find the classes that T1 do not teach at present session.
b. Create a view having fields sname, cname, dept, DOJ, and post
c. Create a view consisting of cname, average salary and total salary of all staff in that college.
d. Select the colleges having highest and lowest average salary using above views.
e. List the staff names of a department using above views.

9. Enrollment (enrollno, name, gender, DOB, address, phone)
Admission (admno, enrollno, course, yearsem, date, cname)
Colleges (cname, city, address, phone,afdate)
FeeStructure (course, yearsem, fee)
Payment (billno, admno, amount, pdate, purpose)

a. Create the above tables with the given specifications and constraints.
b. Insert about 10 rows as are appropriate to solve the following queries.
c. Get full detail of all students who took admission this year classwise
d. Get detail of students who took admission in Bhilai colleges.
e. Calculate the total amount of fees collected in this session
i) by your college ii) by each college iii) by all colleges

10. Enrollment (enrollno, name, gender, DOB, address, phone)
Admission (admno, enrollno, course, yearsem, date, cname)
Colleges (cname, city, address, phone,afdate)
FeeStructure (course, yearsem, fee)
Payment (billno, admno, amount, pdate, purpose)

a. List the students who have not payed full fee
i) in your college ii) in all colleges
b. List the number of admissions in your class in every year.
c. List the students in the session who are not in the colleges in the same city as they live in.
d. List the students in colleges in your city and also live in your city.

11. Subjects (paperid, subject, paper,papername)
Test (paperid, date, time, max,min)
Score (rollno, paperid, marks, attendence)
Students (admno, rollno, class, yearsem)

a. Create the above tables with the given specifications and constraints.
b. Insert about 10 rows as are appropriate to solve the following queries.
c. List the students who were present in a paper of a subject.
d. List all roll numbers who have passed in first division.
e. List all students in MCA-II who have scored higher than average
i) in your college ii) in every college
f. List the highest score, average and minimum score in MCA-II
i) in your college ii) in every college

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List of Practical of HTML

At least 10 practical of HTML & Web Designing

PGDCA-110:Project

1. Scheme of Examination:- The Project should be done by individual student.

Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows

Software Demonstration	-	40
Project Report (Hard Copy + Soft Copy)	-	20
Project Demonstration/Presentation	-	20
Project Viva	-	20
Total	-	**100**

2. Format of the student project report on completion of the project

- Cover page as performat
- Certificate of Approval
- Certificate of project guide/Center Manager
- Certificate of the company/Organization
- Certificate of Evaluation
- Declaration / Self Certificate
- Acknowledgement

In the "Acknowledgement" page, the writer recognizes his /her indebtedness for guidance and assistance of the thesis/report adviser and other members of the faculty. Courtesy demands that he/she also recognize specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expressed simply, tastefully, and tactfully.

- Synopsis of the project
- Main Report
  - ✓ Objectives & Scope of the project
  - ✓ Theoretical Background of Project
  - ✓ Definition of problem
  - ✓ System Analysis &Design
  - ✓ System Planning (PERTC hart)
  - ✓ Methodology adopted, system Implementation & Detail of Hardware & Software used
  - ✓ System maintenance &Evaluation
  - ✓ Cost and benefit Analysis
  - ✓ Detailed Life Cycle of the project
    - ERD,DFD
    - Input and Output Screen Design
    - Process involved
    - Methodology used for testing
    - Test Report, Printout of the code sheet
  - ✓ User/Operational Manual- including security aspects, access rights, back up, Controls etc.
  - ✓ Conclusion
  - ✓ References
  - ✓ Soft copy of the project on CD

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Formats of various certificates and formatting styles are as:

1. **Project report Cover Format**:

A
Project Report
On

Title of the Project Report

(Times New Roman. Italic, Font Size=24)
Submitted in partial fulfillment of the requirements for the award of degree
Post Graduate Diploma in Computer Application

2. Certificate of Approval by Head of the Department in letterhead

CERTIFICATE OF APPROVAL

This is to certify that the Project work entitled"_____"is carried out by Mr/Ms/Mrs_____ , a student of PGDCA at (**College Name)** is hereby approved as a credible work in the discipline of Computer Science & Information Technology for the award of degree of **Post Graduate Diploma in Computer Application** during the year _____**From Durg University, Durg(CG).**

(Head Name)

2. Certificate from the Guide in letterhead

CERTIFICATE

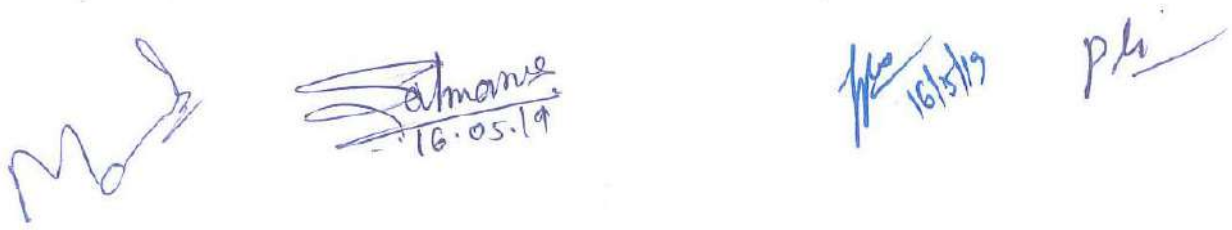
This is to certify that the Project worken titled"_____"Submitted to the **(College Name)** by Mr/Ms/Mrs_____RollNo_____,in partial fulfillment for the requirements relating to nature and standard of the award of **Post Graduate Diploma in Computer Application** degree by **, Durg University, Raipur (CG)** for the academic year 20_ - 20 _.

This project work has been carried out under my guidance.

(Guide Name)

3. Certificate of the Company or Organization from where the Project is done from the Project Manager or Projectguide.

4. Certificate of evaluation in the department letterhead



CERTIFICATE OF EVALUATION

This is to certify that the Project work entitled"_____"is carried out by Mr/Ms/Mrs_____, a student of PGDCA at (**College Name),** after proper evaluation and examination, is hereby approved as a credible work in the discipline of Computer Science & Information Technology and is done in a satisfactory manner for its acceptance as a requisite for the award of degree of **Post Graduate Diploma in Computer Application** during the year_____ from **Durg University, Durg (CG).**

Internal Examiner **External Examiner**

5. Declaration of Student / Self Certificate

DECLARATION

This to certify that the project report entitled"_____",which is submitted by me in the partial fulfillment for the award of the degree of **Post Graduate Diploma in Computer Application, (College Name),** comprises the original work carried out by me.

I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full for the award of any other degree or diploma in this Institute or any other Institute or University.

Place: (Name)
Date: (Roll No)

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16.05.19

16/5/19